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The Coventry Wellbeing Report

2013



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Aileen Clarke

Understanding
mental wellbeing
in Coventry:
Inequalities, levels,
and factors
associated

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Acknowledgements

The authors would like to thank the population of Coventry for their support and willingness to participate in this survey. Furthermore we would like to thank: Coventry City Council and the Coventry Partnership; NHS Coventry and Research Consultant BMG for their collection of the interview data.

Abbreviations

ACORN: A demographic measure used to describe population characteristics

CAPI: Computer Assisted Personal Interviewing Device

CVD: Cardiovascular Disease

IMD: Index of Multiple Deprivation, 2010

MSOA: Middle Super Output Areas

LSOA: Lower Super Output Areas

PAF: Postal Address File

SES: Socioeconomic status, referred to here as socio-demographic variables

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

Aim

To understand how different aspects of living in Coventry are related to mental wellbeing and to make recommendations to Coventry Partnership and NHS Coventry on improving the health and wellbeing of the population of Coventry; responding to needs; informing services and targeting areas for improvement.

Research Questions

1. How are the levels of wellbeing distributed in this sample of people living in Coventry?
2. What factors are associated with mental wellbeing?

Introduction

Since 2010 the Coventry partnership has commissioned the collection of household survey data that includes a measure of mental wellbeing. In each year the survey has included seven key aspects of living in Coventry: equalities and communities, housing and environment, community safety, health and general wellbeing, work and training, transport and accessibility, and general profile questions such as age and gender. The measure used to assess levels of mental wellbeing of the people of Coventry was the Warwick-Edinburgh Mental Well-being scale (WEMWBS); a 14-question validated scale used to measure levels of mental wellbeing [1]

The approach to the survey delivery went through some changes in 2012 and 2013. Some questions were removed while others were included for the first time. The overall survey design changed to reflect the survey aim and was split into three sections: 'Neighbourhoods and Communities' 'Health and Wellbeing' and 'Demographics'.

Background

Coventry, in the south of the West Midlands has a total population of 323,100. The population is relatively young; one in ten people in Coventry is 20-24 years old and this may reflect Coventry's large population of students (approximately 58,490) at the two local universities. Between 2012 and 2013, it was estimated that Coventry's population consisted of 72% white people (British and those who identify as another white ethnicity). Around a quarter of Coventry residents were from Black and Minority Ethnic (BME) groups, including people with Indian, Pakistani, and Bangladeshi origins who comprised 16.3% of the population and Black, African, Caribbean, or Black British ethnicity who made up 5.6% of the population [2].

The health and wellbeing of people who live in Coventry is generally worse than that for England overall. There is a greater proportion of Coventry residents living in areas of higher deprivation (31%) than in England (20%); rates of unemployment are significantly higher than the average for England (9.6% v 8.0%) [2]. Smoking and alcohol consumption are also areas of concern, with higher rates of smoking during pregnancy and alcohol-related hospital admissions than the average in England for both under 18's and other adults [2-3].

These markers demonstrate that the health and wellbeing of Coventry residents are relevant and important for improving the quality of life in Coventry. This report looks at how some of these markers are associated with levels of mental wellbeing and examines those associations which are found to be related to higher or lower levels of mental wellbeing.

What is mental wellbeing and why is it important?¹

Mental wellbeing is one aspect of wellbeing generally which also includes physical and social wellbeing. Mental wellbeing consists of positive psychological functioning, satisfaction with life, happiness, fulfilment, enjoyment and resilience in the face of hardship [4]. There are gaps in the UK knowledge base for understanding and measurement of overall wellbeing [5], and there is evidence which suggests that mental wellbeing is good indicator of how people and populations are able to

¹ This information has been previously published in the 2010 through 2012 reports on Wellbeing in Coventry

function and thrive [6-8]. This is a key reason to investigate factors associated with mental wellbeing in the context of Coventry.

Mental wellbeing and mental health are different terms. 'Mental wellbeing' describes positive states of being, whilst 'mental health' is a term often used to incorporate a spectrum of states from excellent mental health to severe mental health problems.

Much research and practice surrounding mental health and wellbeing focus on mental health problems and on prevention of developing a mental disorder rather than on positive mental health [9]. Research and evaluation into more positive aspects of mental health and wellbeing has been gaining momentum, and is a national public health priority, reflecting the importance and relevance of mental wellbeing and mental health as critical for the population's health and potential capacity to thrive [10].

From previous research, we know that higher levels of mental wellbeing have been associated with better physical functioning at older ages, better self-rated health, reductions in cardiovascular reactivity and decreased death rates in populations with renal failure and human immunodeficiency virus (HIV) [11-14].

It is not only health that is related to wellbeing. Social factors such as unemployment not only create a loss of income but also a loss of social status, identity, a sense of purpose, and ultimately result in greater losses to wellbeing than to income [15-16].

Higher levels of wellbeing are also consistently strongly associated with strong emotional and social support experienced by individuals and communities [17-18]. Deprived environments are associated with many factors which can have an impact on health and wellbeing including [19-20] physical hazards, sleep disturbance, violence, greater crowding and exposure to noise [21-22].

Understanding mental wellbeing in Coventry

The levels and factors associated with mental wellbeing in the population of Coventry have been measured in Coventry on three previous occasions; annually from 2010 to 2012 [23-25]. This report details the fourth commissioned report on the state of Coventry's mental wellbeing. In this report we continue to examine how positive mental wellbeing is associated with other characteristics of people and their life circumstances.

We hope the results of this survey can be taken forward, and, combined with accumulating evidence suggesting the strength of some factors or over others, can underpin public health priorities and to help with decisions and policies for the benefit of all the people of Coventry.

Methods

Investigators from the University of Warwick have been granted permission by the Coventry Local Authority to access 2013 Household survey data.

The Coventry Household Survey was conducted in the first semester of 2013 by research consultants BMG, appointed by the Coventry Partnership. It was conducted among residents of Coventry city as a personal face-to-face household interview, as well as a smaller proportion of 'on street' interviews in order to capture mobile populations. The survey questionnaire contained 55 questions, and was completed on average in 25 to 30 minutes.

Participants of the survey were selected for approach with the aim of obtaining a cross-section of Coventry residents on the basis of Middle Super Output Area (MSOA), and to reflect the age and gender distribution of each MSOA. Interviewers used the age sampling method of asking to speak to the 'household member whose birthday is next'.

The questionnaire included socio-demographic questions, lifestyle questions, environment and surroundings questions, city satisfaction questions, the WEMWBS, and the EQ-5D- an internationally validated health-related quality of life measure.

This report will focus on aspects the survey related to mental wellbeing.

Study sample

A total of 2321 survey interviews were attempted with 107 refusals leaving 2214 surveys conducted. 2208 were completed and available for analysis. All of the interviews took place between January and March 2013. The response rate is unobtainable due to the approach to data collection (quota sample versus random sample). The sample was representative of the population of Coventry on the basis of age, gender, ethnicity. We do not know how representative of Coventry the sample was in relation to amount of physical activity, smoking, alcohol misuse, or other health related variables.

Out of 2208 surveys completed, 2168 valid responses were available for analysis of mental wellbeing. Missing data (n=40) were excluded from analysis.

What was measured?

The measurement of mental wellbeing was undertaken using the WEMWBS, which is a 14-item positively worded scale with five responses from 'none of the time' to 'all of the time' [26]. The minimum score is 14 and the maximum score is 70. The period of assessment covers the previous two weeks up to the completion of the scale. The WEMWBS was completed during face to face interviews where the interviewer handed the computer to the respondent to complete themselves. Where this was not possible, the interviewer read the questions out to the participant.

Other standardised measures

Self-rated health was measured by asking the widely used question 'How would you say your health is, in general?' with five options ranging from 'very good' to 'very bad' [27]. Another measure used for understanding population levels of health is the 'EQ-5D', an internationally validated and reliable set of health and functioning questions, most commonly used for assessing quality of life (not reported here) [28]. The 2010 Index of Multiple Deprivation (IMD) was used to gauge levels of deprivation from 'most deprived' to 'least deprived' on a scale of 1 through 5. Limiting long standing illness/disability, marital status, educational qualifications and ethnicity were assessed using the 2011 census questions [29].

New questions were added in 2012 were also asked this year, regarding level of social contact (Question 9), support networks (Question 10) quality and access to parks, and clean, maintained roads (Question 15), relative income (Question 40), and financial worries (Question 41). Questions added this year included 'How often do you talk to your neighbours?' (Question 8) 'All things considered, how satisfied are you with your personal relationships?' (Question 11) and 'To what extent do you agree that you have time to do the things that you really enjoy?' (Question 12).

Data collection and sampling

Data collection was undertaken in the first quarter 2013 of by BMG using a trained interviewing team. The survey was piloted before the main fieldwork commenced. The sample was structured by using sample quotas for gender and age and ethnicity to accurately reflect the adult population

profile of each Middle Super Output Area (MSOA) Approximately 50 surveys were also conducted around Coventry city centre to ensure the participation of ‘mobile populations’.

Data processing

Data entry, checking, cleaning, quality assurance and primary coding were undertaken by BMG. The cleaned dataset was submitted to the Coventry Partnership and Warwick Medical School for analysis. At all times all answers were kept confidential and anonymous (personally identifying information was removed from the dataset), meeting the requirements of the Data Protection Act legislation.

Statistical methods

We noted frequencies of responses for all the questions and examined the distribution of WEMWBS scores to identify the normality of the spread of scores. Using the Central Limit Theorem we treated the data as Parametric. We conducted the analysis in two key stages,. 1) Adjusting for age and gender, we used simple linear regression to test for associations between individual factors and WEMWBS score². Factors that were found to be significantly associated with mental wellbeing in this process (or that have been consistently reported as important for mental wellbeing in previous research) were 2) included in multiple regression analyses³ [30]. ***Multiple Regression is used to identify those factors which collectively explain the variation of WEMWBS scores best.***

Factor levels for individual variables are reported in terms of regression coefficients (β). This can be reported as a positive or negative number. The larger ‘ β ’ is, the stronger the association is with mental wellbeing for that particular factor.⁴

² All WEMWBS score differences which are statistically significant between different levels of other variables (at the 5% significance level) are reported as such. This is expressed based on the ‘p-value’. If a difference is significant at the 5% level, the p-value will be less than 0.05. The smaller the p-value, the stronger the evidence that the observed difference is not due to chance.

³ The analysis yields a set of factors which predicts an individual’s mental wellbeing best according to a statistical scoring criterion (adjusted R^2).

⁴ The regression coefficient (B) illustrates the strength of the association between a given factor and mental wellbeing, measured in WEMWBS score units. The larger B is (either positive or negative), the stronger the association for that particular factor with mental wellbeing.

In 2012, in-depth analysis identified several points which differentiated the 2012 analysis method with those of previous years. Correlations were identified which partially mask the full relationship between potential factors (independent variables) and mental wellbeing (the dependent variable). These correlations are called multicollinearity. The variables identified in 2012 were self-rated health and life satisfaction. This means that independent variables are associated with other independent variables in ways similar to how they are associated to the dependent variable. While these variables remain important and relevant to mental wellbeing they have not been included in the 2013 analysis after initial analysis identified the same risk.

These variables remain closely related to mental wellbeing and are just as important as ever in understanding health, society and mental wellbeing, but because we want to identify other variables related to mental wellbeing, we don't want these variables to obscure these findings.

Finally, the inclusion of additional questions year on year means different variables are entered into the model than in previous years- each model is different, and dependent on those variables. This can affect the relationship between some variables associated with mental wellbeing in the past, meaning they can 'drop out' of a model or be present depending on what other variables are included in the model.

Results

A total of 2208 survey interviews were conducted, with 2168 of those interviews identified as valid for the purposes of this report.

The findings are presented in three parts: ‘demographics’ ‘neighbourhoods and communities’ and ‘health and wellbeing’.

In this section, the demographic characteristics of the sample participants are presented. The next section looks at the relationship between factors and WEMWBS scores.

Response rate comparison across years

This table presents questionnaires completed and attempted for each survey year including questions on mental wellbeing. The response rate and number of valid WEMWBS questionnaires completed is given.

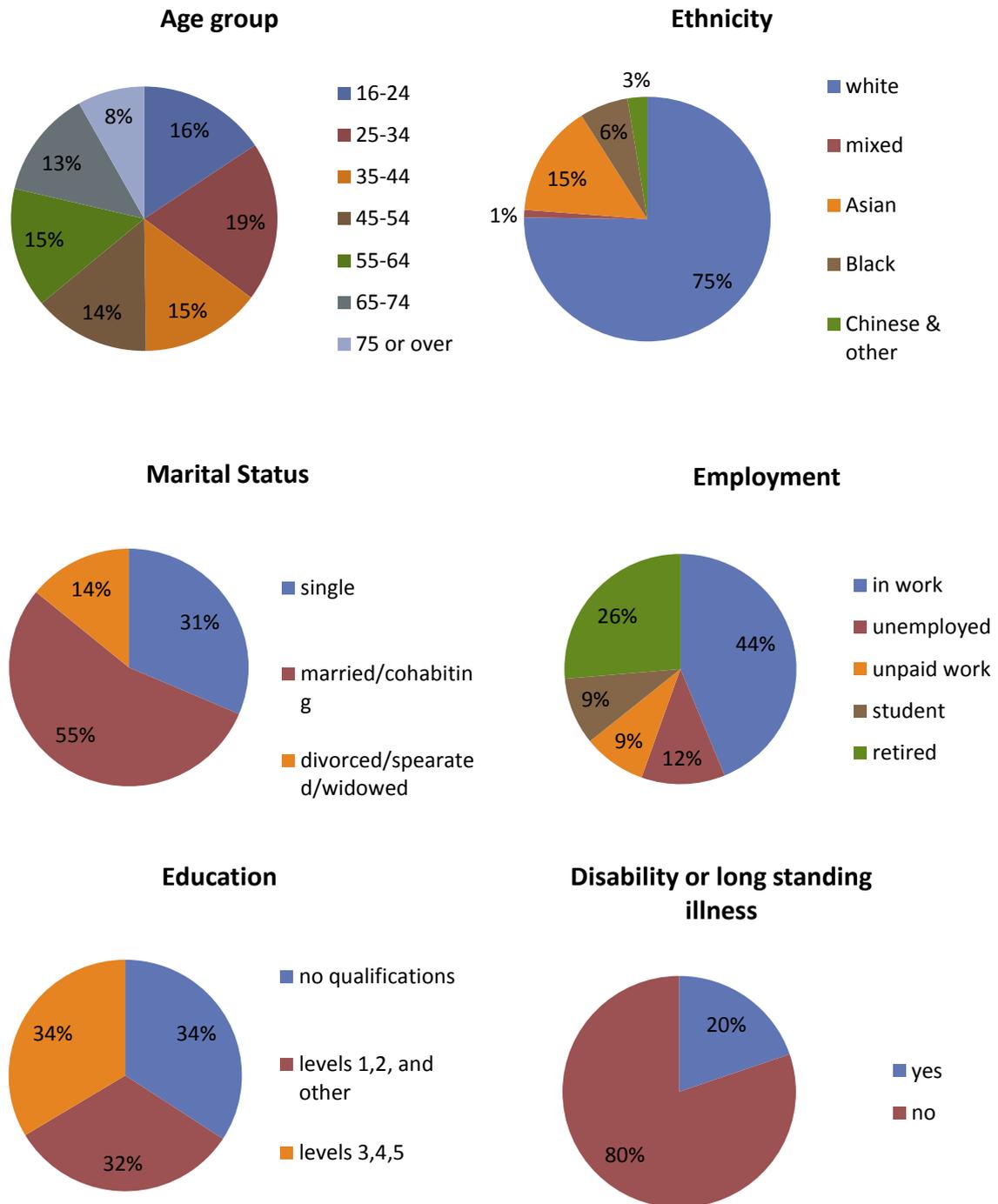
Table 1: Number of respondents by survey year

Survey year	Approx. no. approached	Completed questionnaires	Response rate	Valid WEMWBS
2010	8500	3750	44% (2800 refusals)	3370
2011	9000	3548	40% (2415 refusals)	2707
2012	Unknown, est. 9-10,000	2117	Unknown, est. 20-25%	2111
2013	Not recorded due to sampling approach	2208	n/a	2168

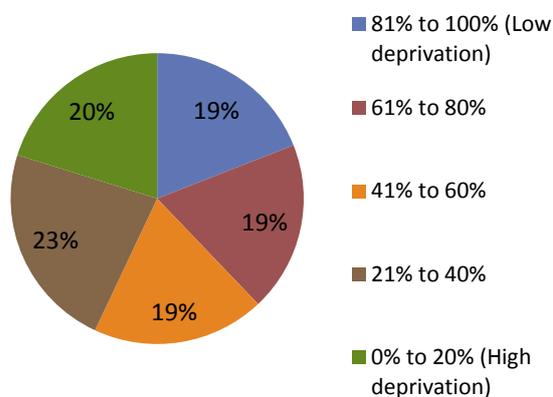
Participant characteristics

Figures 1 through 4 show the characteristics of those participating in the survey and their responses to questions about their health, sleep, neighbourhoods and connectedness in communities. The figures are each followed by a description of the proportions.

Figure 1: Demographic characteristics



Deprivation Quintile



Age: Age bands were fairly evenly distributed and consistent with last year; about one sixth of the sample in each ten year age band with just under 20% in the 25-34 age group and 8% of the sample being aged 75 or older.

Gender: 48% of the sample were men and 52% women (not shown).

Ethnicity: The ethnicity of the sample reflects the population of Coventry. Three quarters of the sample are white.

Marital status: 55% of the sample were married or cohabiting, just under a third were single, and 14% of the sample were divorced, widowed or separated.

Employment: A smaller proportion of participants were in work this year (44%) compared to last year (48%). Just over a quarter were retired. Of the remainder, 9% were students or in training and 21% were unemployed or in unpaid work.

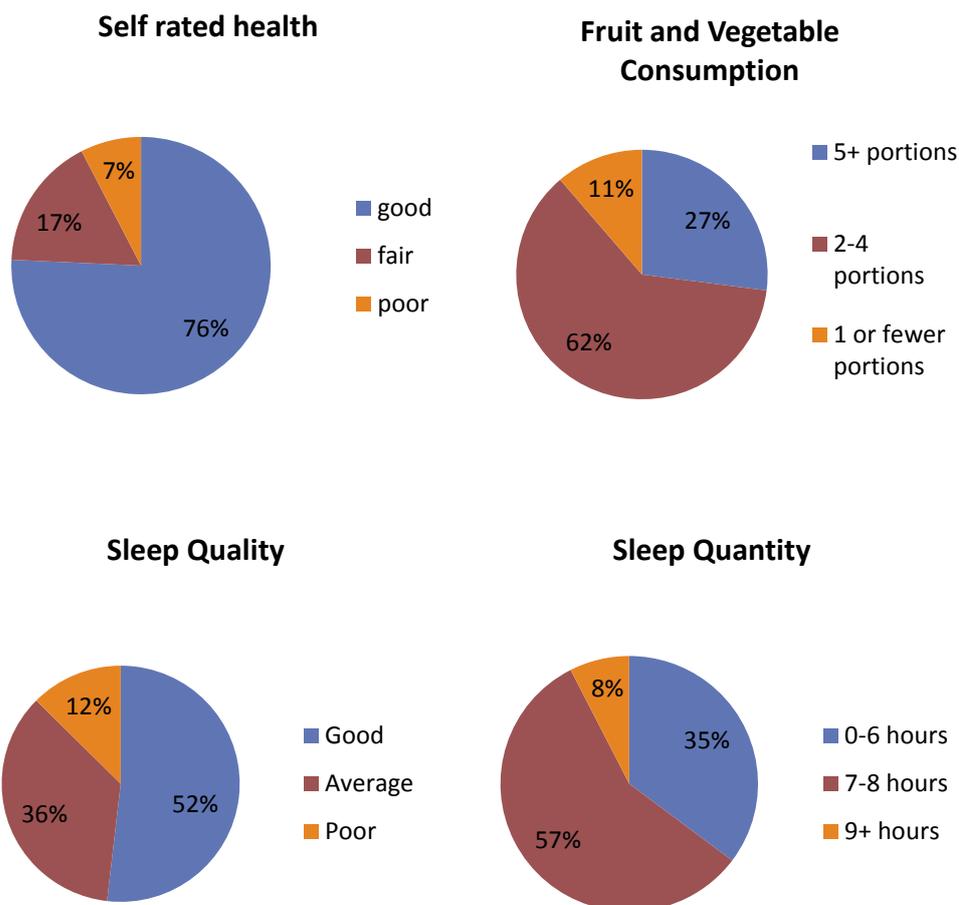
Education: Educational attainment was distributed evenly across groups in this sample. Approximately one third of participants had no formal qualifications, had level one or two qualifications (equivalent to GCSEs) or had higher level qualifications.

Deprivation: Using the government’s index of multiple deprivation quintile categories, 43% of the sample were in the most and second most deprived categories. Thirty-eight per cent (38%) were in the 3rd and 4th least deprived categories, with one fifth of the sample (19%) in the least deprived category. This proportional breakdown reflects equal proportions of participants in each category

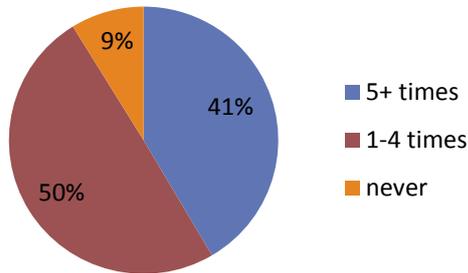
rather than reflecting Coventry’s deprivation quintiles. For comparison we have presented proportional breakdown for deprivation in Coventry in 2013 (Using IMD 2010).

In Coventry		Frequency (n of LSOAs)	Percent
Deprivation Group	Group 1 (most deprived)	61	31.0
	2.00	51	25.9
	3.00	42	21.3
	4.00	32	16.2
	5.00 (least deprived)	11	5.6
	Total	197	100.0

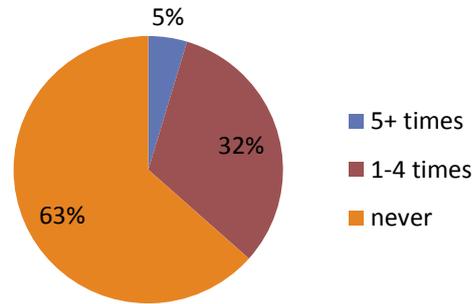
Figure 2: Participants’ Health and Wellbeing characteristics



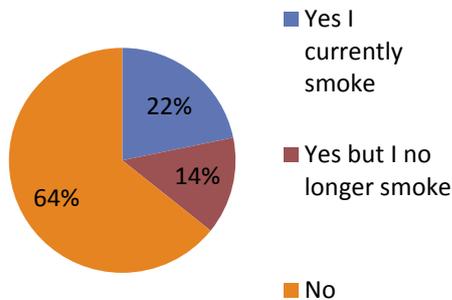
Any Physical Activity



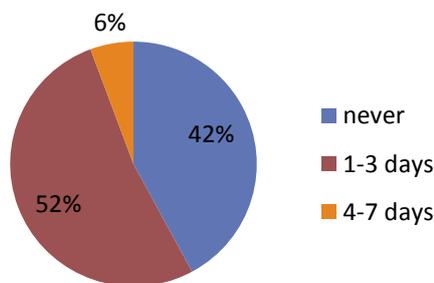
Sports



Smoking



Alcohol



Self-rated health status: Around three quarters of participants rated their health as good, with one sixth reporting fair health (17%) and 7% reporting poor health. 80% of the sample reported they had no limiting or longstanding illness, 13% said that they had an illness which limited them a little and 7% had an illness which limited them a lot (not shown).

Fruit and vegetables: Over a quarter (27%) of the sample said that they ate the daily recommended 5-a-day portions of fruit and vegetables a day, the majority ate between 2 and 4 portions (62%) and only 11% ate 1 or fewer portions.

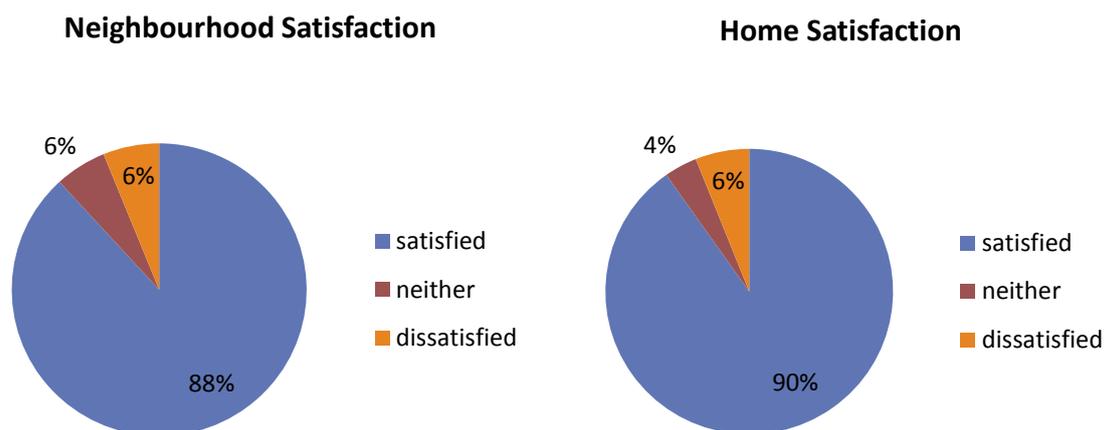
Sleep: Over half of the sample this year (52%) reported good quality sleep, compared with 44% last year, and 54 to 59% in 2011 and 2011. A little over a third reported average sleep and 12% reported poor quality of sleep. As far as quantity of sleep was concerned, nearly 60% had about 7-8 hours a night, over a third (35%) had 6 hours of sleep or less a night. Eight per cent said that they had 9 hours or more of sleep a night.

Physical activity and sports: a little over 4 out of 10 respondents reported doing any type of physical activity 5 or more times per week. Half of respondents report being physically active between 1 and 4 times a week. Nine per cent (9%) of respondents said that they never did any type of physical activity. A much smaller proportion reported playing sports 5 or more times per week (5%) than participating in any physical activity. A third of respondents reported playing sports between one and four times per week, with about six in ten respondents never playing sports weekly.

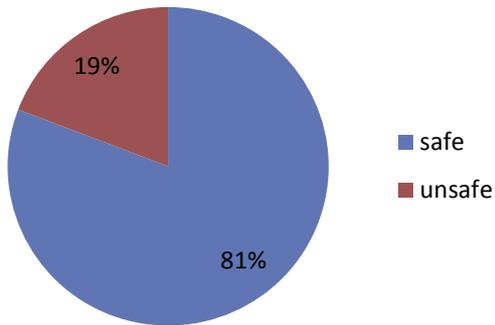
Smoking: Twenty-two per cent of the sample report currently smoking, while 14% have quit smoking and a little under two thirds of respondents have never smoked (64%).

Alcohol: Almost 60% reported drinking alcohol over the daily recommended amount at least once a week while the remaining proportion reported never drinking over the recommended amount. While this proportion is higher than last year where half of respondents were drinking over the limit at least once a week, it is a more consistent figure with previous years (2010=57%, 2011=58%). Based on the CHS samples, a large proportion of people in Coventry continue to drink over the recommended daily limit at high levels, and this continues to be a concern for the health of the public.

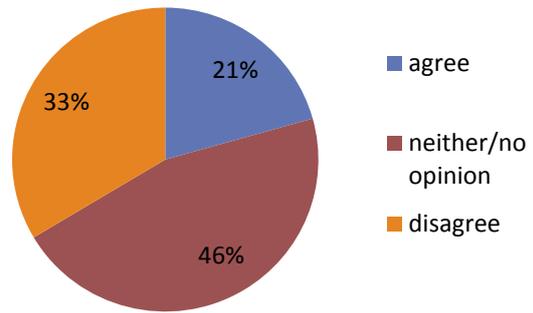
Figure 3: Participants' neighbourhood and community environment



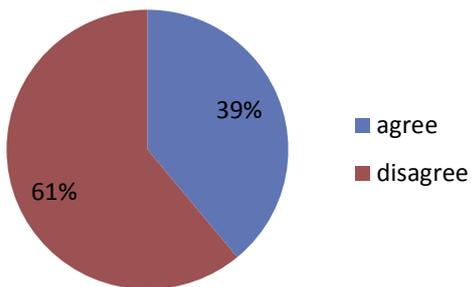
Night time safety



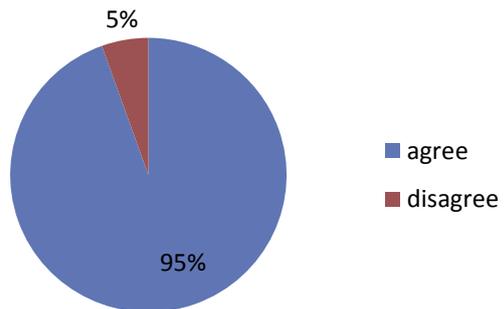
Crime increase in past year



Influence Decisions in local Area



Agree that people in your neighbourhood from different backgrounds get along



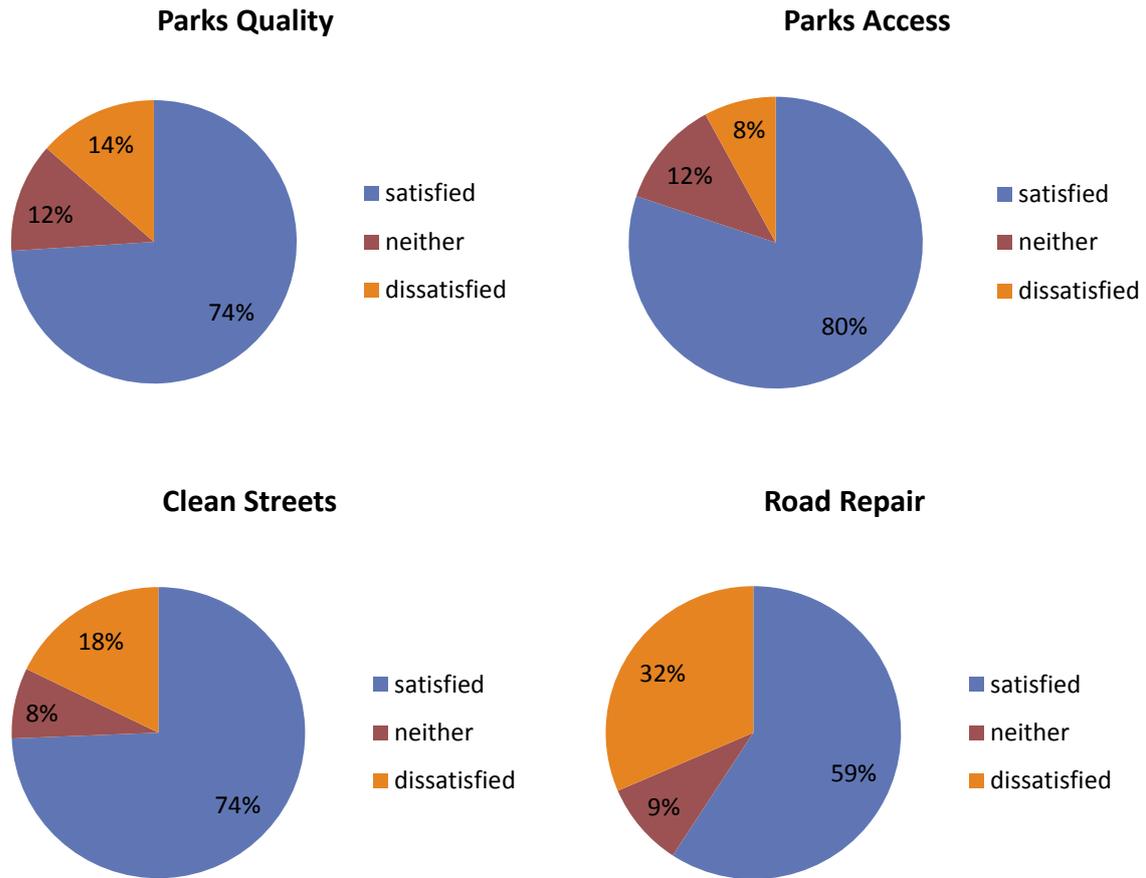


Figure 3 shows participants' responses to questions about their neighbourhood and environments.

Satisfaction with neighbourhood and with the home: 88% of the sample were satisfied with their neighbourhood and 9 out of 10 respondents were satisfied with their home. A small proportion (6%), were dissatisfied with their home and/or with their neighbourhood.

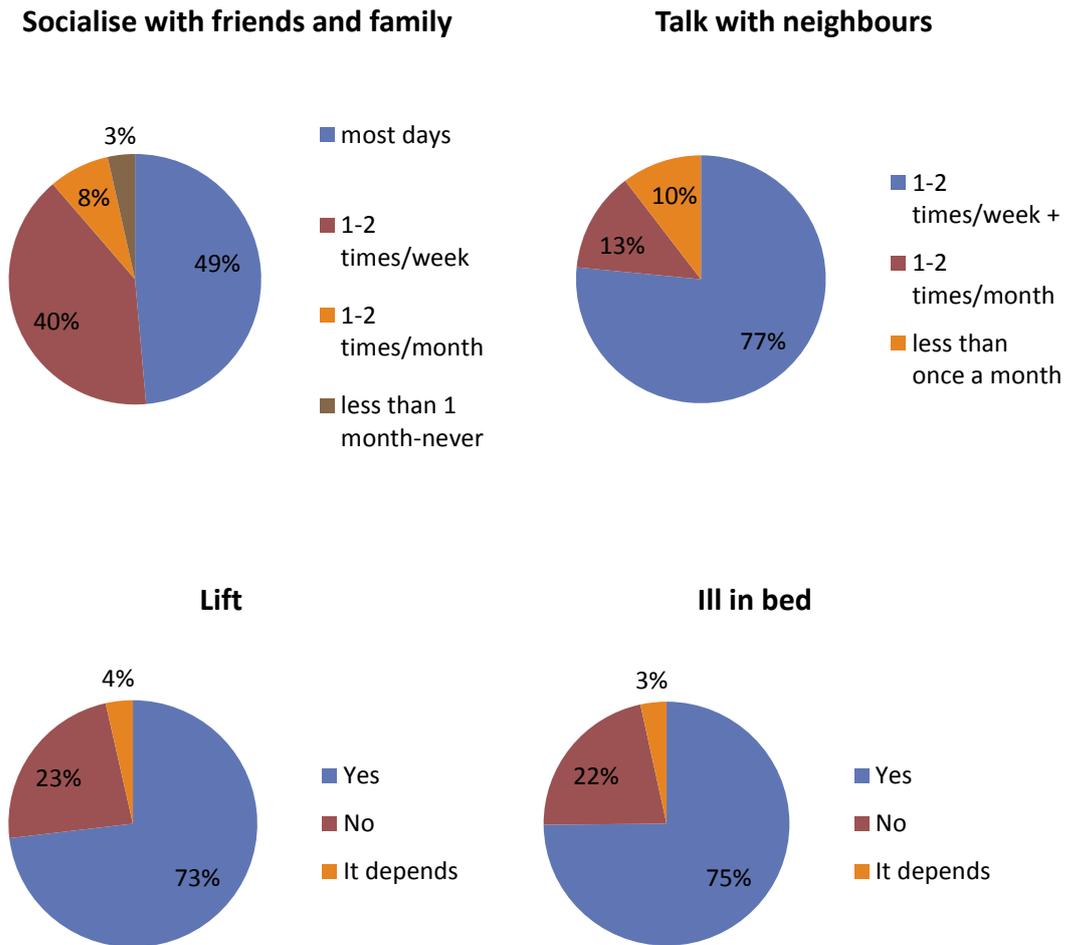
Safety and crime: Eight in ten respondents stated that they feel safe in their neighbourhood at night; with 19% reporting that they feel unsafe. Under a quarter of the sample thought that crime had increased in the past year, with a third reporting they thought that crime had not increased. 46% had no opinion or neither agreed nor disagreed.

Influence decisions in local area: About 6 out of 10 respondents reported they did not agree they could influence decisions in their local area. Four out of ten agreed they felt they could influence decisions in their local area. 'Not sure' responses were excluded from this proportion.

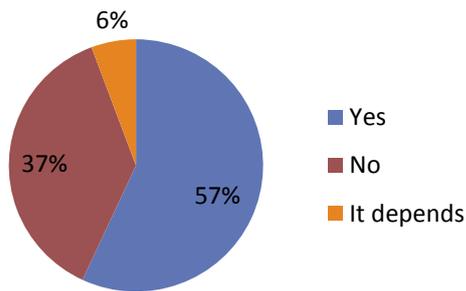
Agree that people from different backgrounds get along well in your neighbourhood: Almost all respondents agreed with this statement (95%), with the rest disagreeing (not shown).

Satisfaction with the standards of local environment: Over three quarters of respondents are satisfied with the quality of local parks and open spaces, while 8 out of 10 report satisfaction with the access to parks. While a quarter are satisfied with the cleanliness of the streets, a smaller proportion of respondents are satisfied with road maintenance (59%).

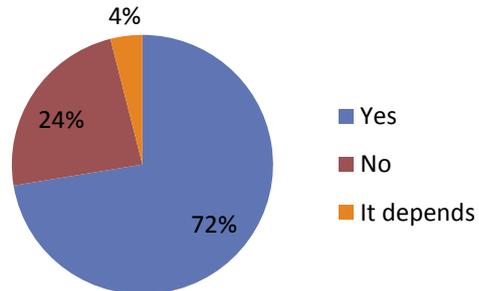
Figure 4: Social support and connectedness in the community



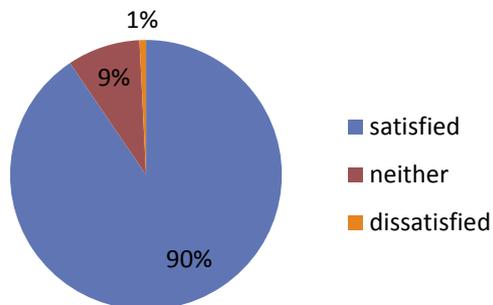
Borrow £100



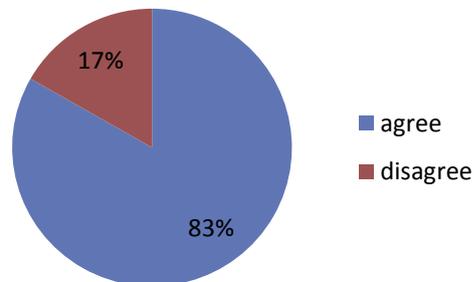
Crisis



Personal Relationships



Have time to do things you enjoy



Socialising with friends and family: The vast majority socialise with friends and family at least once a week (90%). Eight per cent (8%) socialised about once or twice a month and 3% rarely or never socialise with friends or family outside the home.

Talk with neighbours: The majority of participants also talked with their neighbours at least once a week or more and one in ten talk with their neighbours less than once per month.

Support in situations of need: When respondents were asked about whether they would ask anyone for help, around three quarters respondents reported 'yes' they would ask for help if they were having a personal crisis, if they were ill in bed or if they needed an urgent lift. A lower proportion of around 6 in 10 respondents reported they would ask someone for money if they were in financial difficulty and needed to borrow £100.

Have time to do things you enjoy: Over 80% of participants felt they did have time to do the things they really enjoy, while one sixth (17%) did not feel they had this time.

Satisfaction with personal relationships: 9 out of 10 participants responded they were satisfied with their personal relationships, all things considered. For most of the remaining proportion of participants, they were neither satisfied nor dissatisfied with their relationships. 1% were dissatisfied with their personal relationships.

Summary of sample characteristics

Overall the findings suggest that the sample are representative of Coventry as far as age, gender, and ethnicity are concerned. Deprivation levels reflect equal proportions from the sample, rather than deprivation levels in Coventry, (as in previous household surveys measuring mental wellbeing). ***As a consequence, differences across years should be interpreted with caution, as these differences may be due to systematic changes in the way participants were sampled from the population.*** For example, the change in the proportion smoking this year may have been affected by the decrease in participants who live in more geographically deprived areas, because we know that people who live in more deprived areas tend to have a higher prevalence of current smokers compared with other, less deprived areas.

The proportion of people doing any physical activity (1 to 5+ times per week) has shown small but consistent increases over the past 4 years. This reflects the decreasing proportion of those reporting they never do any physical activity. It will be important in the coming years to continue to monitor these patterns to identify whether they may be due to a measurement error or actually reflect population changes.

While the consumption of 5+ fruits and vegetables a day has fluctuated from year to year, there are no apparent trends based on the proportions. The same lack of increasing or decreasing trend is true for playing sports, quality and quantity of sleep, and self-rated health.

Concerning respondents neighbourhoods and communities, people remain satisfied with their neighbourhoods and to a greater degree their homes. There has been a steady decrease in the proportion who agree that crime has increased in the past year, while the proportion of those who feel safe at night has shown a small, steady increase over time.

The majority of participants in this survey were satisfied with their personal relationships and felt that they had time to do the things they really enjoy. The majority socialise with friends and family on a weekly basis. Similarly, most are satisfied with the quality and access to parks and open spaces,

but a greater proportion are dissatisfied with the cleanliness of streets and the maintenance and repairs of roads in Coventry, at similar levels to last year.

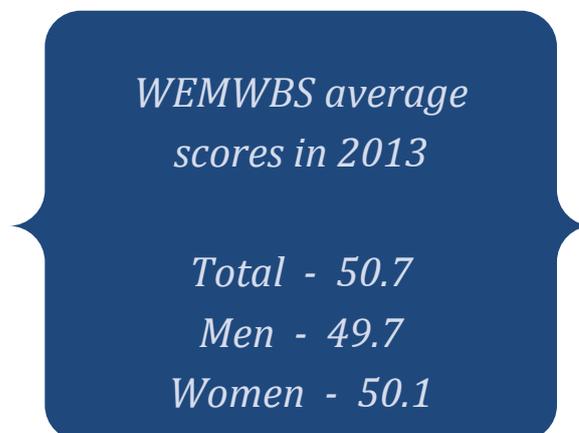
In the next section we go on to look at how these factors are correlated with levels of mental wellbeing. First we report the WEMWBS scores.

Wellbeing scores in Coventry using the WEMWBS

This section describes the distribution of WEMWBS scores in the sample and factors associated with wellbeing, answering the research questions set out:

1. How are the levels of wellbeing distributed in this sample of people living in Coventry?
2. What factors are associated with mental wellbeing?

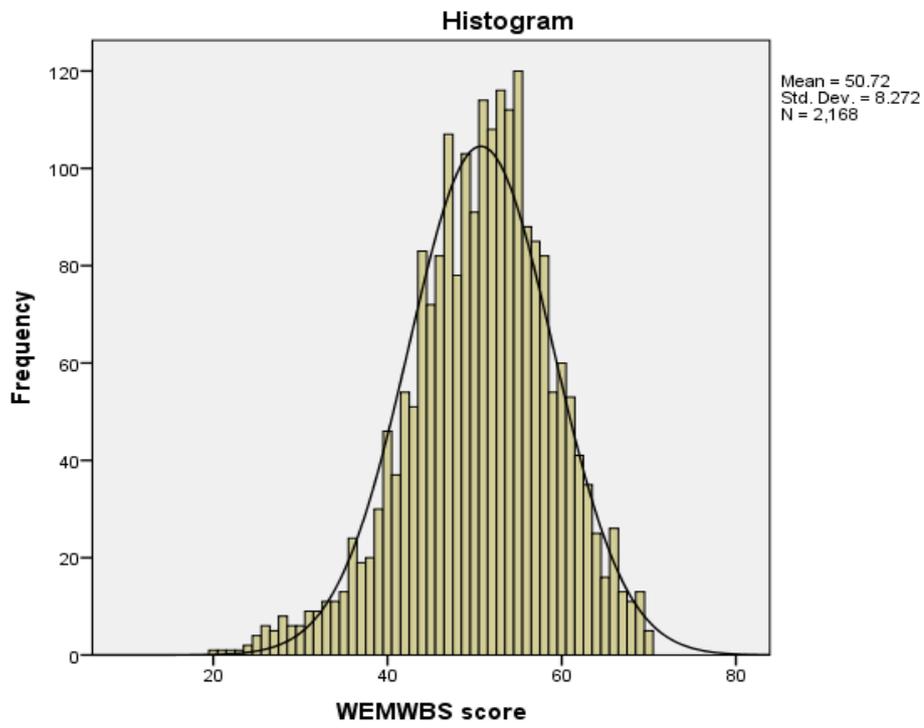
The average (mean) WEMWBS score for all participants combined was 50.7, with a standard deviation of 8.27. Raw mean WEMWBS scores are different for men (49.7) and women (50.1).



These figures are lower than in previous years. The difference between mean WEMWBS scores for men and women is not statistically significant.

The figure below illustrates the distribution of WEMWBS scores within the total sample (WEMWBS ranges from 14-70), showing a good agreement with a 'normal distribution' and it is consistent with other distributions of WEMWBS scores.

Figure 5. Distribution of WEMWBS scores



WEMWBS and population characteristics

Tables 2-6 show average WEMWBS responses for each variable from each year of the survey. This provides a look at how mean, unadjusted scores fluctuate over time and across samples. While some questions have been asked in each survey, some have not, and these are indicated as (--), and in the case of some social support questions, the columns for 2010 and 2011 have not been included because none of the questions were asked in those years.

Note that the 2012 mean WEMWBS scores are significantly higher than all other years, and we hypothesise that this is due to a systematic measurement error which occurred in the 2012 data collection process.

Table 2: Socio-demographic variables

Participant characteristics by survey year				
Year	2010	2011	2012	2013
Demographic Variable	Mean WEMWBS score n=3370	Mean WEMWBS score n= 2707	Mean WEMWBS score n= 2111	Mean WEMWBS score n= 2168
Total sample	100	100	100	100
Age Band				
16-24	52.5	53.7	55.7	51.4
25-34	51.9	52.8	55.9	51.3
35-44	51.2	51.8	54.4	50.2
45-54	49.3	51.1	52.2	50.5
55-64	50.8	50.1	53.2	51.0
65-79 *(65-74)	51.7	51.6	*53.2	*50.9
80+ *(75+)	48	50.6	*51	*48.8
Gender				
Male	52	52.5	54.7	50.9
Female	50.5	51.3	53.4	50.5
Ethnicity				
White	50.8	51.6	53.6	50.7
Mixed	50.7	50.3	54.4	51.2
Asian	52.	52.7	55.4	50.7
Black	54.	52.6	57	51.3
Chinese & other	53.6	54.6	55	51.1
Marital status				
Single	51.2	52.1	54	50.5
Married/cohabiting	51.7	52.3	54.7	51.4
Separated/divorced/widowed	49.4	49.4	51.6	48.8
Deprivation				

Quintile 1 (most deprived)	49.7	52.3	54.2	49.3
Quintile 2	51.2	50.9	53.2	50.4
Quintile 3	52.6	52.4	54.6	50.3
Quintile 4	51.8	51.3	54.2	51.3
Quintile 5 (least deprived)	51.7	53.1	54.7	52.5
Education level				
No qualifications	49.3	50.2	51.2	49.2
Levels 1 and 2; other qualifications	51	52	54.6	51.0
Levels 3, 4 & 5	53.1	53	55.6	52.1
Employment status				
In work	52.4	52.8	55.6	51.6
Unemployed	47	47.9	49	46.4
Unpaid work	49.5	50.4	53.3	51.5
Retired	50.7	50.3	52.9	50.5
Student	53.2	55.1	55.4	52.2

Table 3: Health and Lifestyle

Health and lifestyle characteristics by year

Year	2010	2011	2012	2013
Health and Lifestyle Variable	Mean WEMWBS score n=3370	Mean WEMWBS score n= 2707	Mean WEMWBS score n= 2111	Mean WEMWBS score n= 2168
Self-rated health status				
Good	52.6	53	55.8	52.3
Fair	47.9	48.2	50.1	47.0
Poor	42.7	43.2	44.1	43.4
Disability				
No disability	52.2	52.7	55.6	44.2
Limited a little	48	47.7	50.5	47.5
Limited a lot	44.8	45.1	45.9	51.7
Quality of sleep (past month)				
Good	53.1	53.6	56.6	52.8
Average	49.6	51.1	53.8	49.3
Poor	45.5	46.9	47	46.0
Quantity of sleep (hours per night)				
Fewer than 6 hours	48.9	49.9	51	48.8
7-8 hours	52.3	53	56	51.8
9 hours or more	52.1	51.4	56	52.3
Daily fruit/vegetable				
5+ portions	53.0	53.3	55.4	52.7
2 to 4 portions	50.8	51.7	54	50.2
1 or fewer portions	49.1	50.4	50.6	48.9

Physical activity:				
Any activity weekly				
5+ times per week	51.9	53.3	55.1	52.3
1-4 times per week	51.4	52.1	54.2	50.1
Never	48.5	48.2	49.5	46.9
Physical activity:				
Play sports weekly				
5+ times per week	53.5	54.4	57.2	54.1
1-4 times per week	53.2	52.7	55.9	52.5
Never	50.2	51.1	52.6	49.6
Smoking				
Yes, Currently	49.6	51.1	52.2	49.2
Yes, Former	51.4	50.6	52.8	51.1
No, Never	51.7	52.3	55	51.2
Alcohol consumption:				
Days/ week drink > daily recc. amount				
Never	51.2	52.7	53.9	52.0
1-3 days per week	52.2	52.3	54.9	51.4
4-7 days per week	49.3	50.1	50.4	50.6

Table 4: Neighbourhoods and communities

Neighbourhoods and communities variables by survey year				
Year	2010	2011	2012	2013
Communities Variable	Mean WEMWBS score n=3370	Mean WEMWBS score n= 2707	Mean WEMWBS score n= 2111	Mean WEMWBS score n= 2168
Housing tenure				
Owner occupied	51.6	52.4	54.3	51.1
rented	50.3	52.4	53.4	50.0
Neighbourhood satisfaction				
Satisfied	51.5	52.1	54.4	51.2
Neither satisfied nor dissatisfied	49.4	50.2	52.9	47.3
Dissatisfied	47.4	51.1	49	47.1
Satisfaction with quality of home				
Satisfied	51.5	52.1	54.4	51.1
Neither satisfied nor dissatisfied	50.7	50.1	52.4	47.0
Dissatisfied	46.7	48.8	48.6	47.6
Night-time neighbourhood safety				
Feel safe	52.1	52.5	54.8	51.2
Feel unsafe	48.8	49.9	50.9	48.7

Feel that crime has increased in neighbourhood in past year				
Agree	49.7	50.9	51.5	49.7
Neither agree nor disagree	51.4	51.4	54.6	50.9
Disagree	51.9	52.8	54.8	51.1
No opinion	--	52.1	54.8	--
Influence decisions				
agree	52.4	52.7	55.4	51.6
disagree	50.3	50.8	53.1	50.2
Diverse backgrounds get along				
Agree	51.6	52.6	54.3	50.9
disagree	48.1	50.8	52.8	47.9

Table 5: Social support and connectedness, and financial worries

This table shows questions asking in the 2012 and 2013 household surveys. The questions ask about whether people would ask for help in various situations, personal relationships, socialising frequency, financial worries and perceptions of income.

	Mean WEMWBS score n= 2111	Mean WEMWBS score n= 2168
Would you ask anyone for help in the following situations?		
Need an urgent lift		
Yes	54.2	50.8
No	53.4	50.6
It depends	53.1	49.2
Ill in bed and need help at home		
Yes	54.4	51.0
No	52.6	50.1
It depends	53.1	49.3
In financial difficulty and need to borrow £100		
Yes	54.6	51.4
No	53.2	50.1
It depends	54.3	48.8

You have a serious personal crisis and need someone for support		
Yes	54.5	51.0
No	52.7	50.3
It depends	52.5	48.2
Frequency of socialising with friends or family who do not live with you		
On most days	54.8	51.2
Once or twice a week	54	50.7
Once or twice a month	52.3	48.9
Rarely or Never	52	46.8
How often do you talk with your neighbours?		
On most days	--	50.9
Once or twice a week	--	50.8
Once or twice a month	--	50.4
Never/Less than once a month	--	50.3
How satisfied are you with your personal relationships?		
Satisfied	--	51.2
Neither	--	46.7
Dissatisfied	--	39.2
Do you agree that you have time to do the things that you really enjoy?		
Agree	--	51.4
Disagree	--	47.1
Statement that best describes present income		
Living comfortably	56.5	53.2
Coping	53.8	50.1
Finding it difficult	50.3	47
Finding it very difficult	45.7	47.3
Frequency worrying about money in the past few weeks		
Almost all the time	48.1	47.3
Quite often	51.8	48.6
Only sometimes	54.2	50.3
Never	56.5	52.6

*Variables included in the 2012 and 2013 surveys.

Table 6: Environment

How satisfied are you with the quality of parks and open spaces in your neighbourhood?	2012 mean WEMWBS scores	2013 mean WEMWBS scores
Satisfied	54.7	51.3
Neither satisfied nor dissatisfied	53.3	49.7
Dissatisfied	52.2	48.4
Access to parks		
Satisfied	54.5	51.3
Neither satisfied nor dissatisfied	53.7	49.0
Dissatisfied	51.9	47.7
Street cleanliness		
Satisfied	54.7	51.4
Neither satisfied nor dissatisfied	52.7	51.1
Dissatisfied	52.4	48.8
Road maintenance & repairs		
Satisfied	54.9	51.2
Neither satisfied nor dissatisfied	52.9	49.5
dissatisfied	52.4	50.3

Factors associated with mental wellbeing

The tables above provide an unadjusted look at how mental wellbeing fluctuates across year groups, samples, and variables. The section below shows the variables associated with mental wellbeing **after accounting for differences because of age and gender** (univariate analysis). Variables significantly associated with wellbeing scores were then included in the multiple linear regression analysis (where all variables are adjusted for simultaneously).

Socio-demographic variables: Age, gender, employment status, education, marital status

Health and lifestyle characteristics: Self-rated health status; Disability, quality and quantity of sleep, fruit and vegetable consumption, frequency of physical activity and frequency of playing sport, smoking.

Social support variables: Satisfaction with personal relationships, time for enjoyable things, socialising with friends or relatives, asking for help when: ill in bed, when having a personal crisis.

Neighbourhood characteristics: Satisfaction with neighbourhood, feeling safe at night, satisfaction with home, deprivation, housing tenure, influence decisions, get along with people from other backgrounds in neighbourhood, satisfaction with parks quality and access.

Not significantly associated: Alcohol over the recommended daily amount, belief that crime increased in neighbourhood in past year, frequency of talking with neighbours, asking to borrow £100 in a time of need, needing a lift, satisfaction with street cleanliness and road repair and ethnicity were not associated with mental wellbeing in the univariate analysis.

The figures in the next section show results from the multiple regression model which adjusts for all factors simultaneously so that reported differences are due to the factor illustrated for each figure.

Differences in Mental Wellbeing

This section presents which factors/variables are associated with mental wellbeing in Coventry when all variables are simultaneously accounted for. First we present socio demographic associations, followed by health and lifestyle factors, social support, and then neighbourhoods and communities. The findings are discussed.

Associated variables:

The boxes below shows variables associated with mental wellbeing in the multiple regression model in addition to age, education, employment, and disability:

Among men:

- Sleep quality
- Any physical activity
- Play sports
- Feel you can influence decisions in local area
- Marital status
- Night safety in neighbourhood
- Satisfied with personal relationships
- Have time to do the things you really enjoy
- Worry about money
- Access to parks and open spaces

Among women:

- Sleep quality
- Any physical activity
- Play sports
- Fruit and vegetables consumption
- Neighbourhood satisfaction
- Home satisfaction
- Marital status
- Night safety in neighbourhood
- Satisfied with personal relationships
- Time to do the things you really enjoy
- Socialise with friends and family
- Access to parks and open spaces

These variables will be presented and discussed in the next section.

Understanding multiple regression outputs:

The figures in the next section show results from the multiple regression model which adjusts for all factors simultaneously so that reported differences are due to the factor illustrated for each figure, while accounting for the variation in WEMWBS scores due to other variables.

In the analysis, the regression coefficient (Beta) illustrates the strength of the association between a given factor and mental wellbeing, measured in WEMWBS score units. It is labelled 'WEMWBS Association' on the Y axis (The vertical axis). The farther away from zero the Beta coefficient is, the stronger the association of the variable with WEMWBS scores. The association can be either positive or negative, and will depend on what the *reference category* is. The reference category refers to the one category within a variable to which the other categories are compared.

For example, WEMWBS scores are on average 1 point higher for those with higher education qualifications compared to those with no formal educational qualifications (the reference category) when adjustment has been made for all other factors (e.g. age, fruit and vegetable consumption, sleep quality, etc). This suggests that higher education is associated with higher levels of mental wellbeing. Education might therefore be considered a factor associated with mental wellbeing.

WEMWBS associations by variable

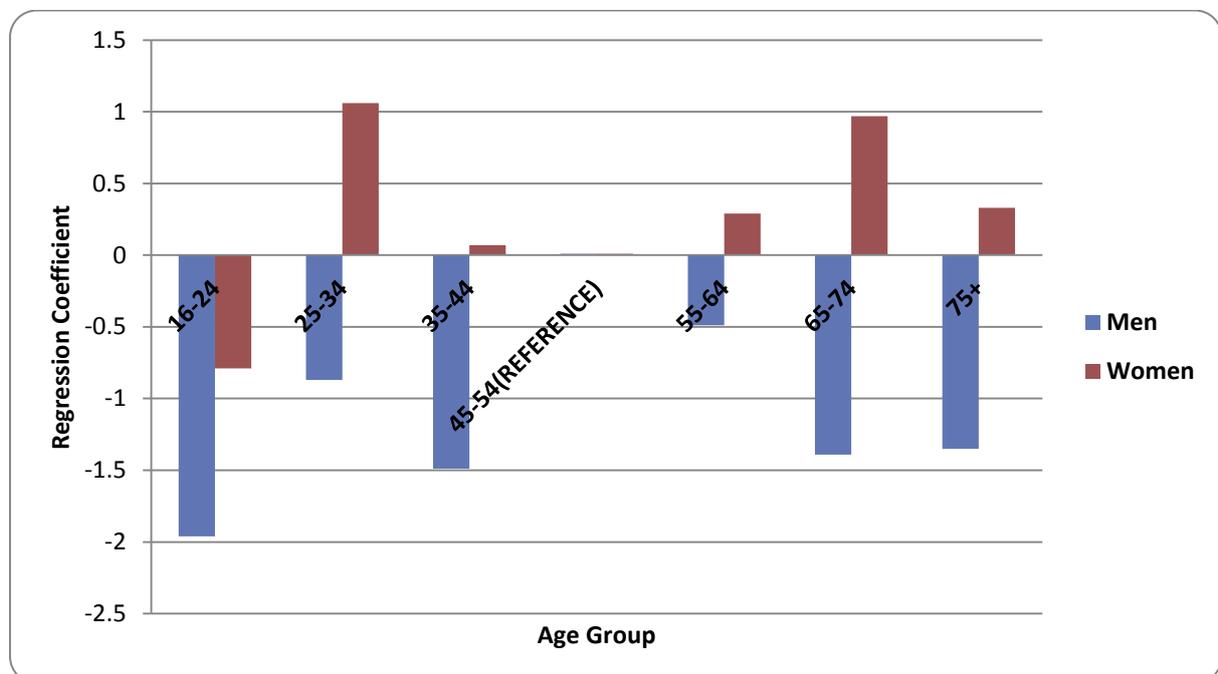
The following figures describe what factors are associated with mental wellbeing in Coventry. Both positive and negative associations are shown in the bar charts, and the figures are presented for men (n= 1036) and women (n= 1132). These will be presented in three main sections:

- Socio-demographics
- health and lifestyle, social connectedness
- neighbourhoods, environment, communities

Gender & Age

There were no statistically significant differences overall between men and women in the 2013 analysis. However, results will still be presented stratified by gender because we know from previous surveys that there are differences in mental wellbeing for men and women. differing by gender, which has implications for how services can be developed.

Figure 6. Associations between age and mental wellbeing



WEMWBS scores and age group

Figure 6 is the multiple linear regression output for age. While the pattern shown in the graph is very different for men and women, the confidence interval around the mean (margin of error) suggests that for both men and women, WEMWBS scores are just as likely to be higher or lower than 45-54 age group when looking at other age groups.

- For example, the age group 16-24 has confidence limits for β (the measure of the association) that range from -2.7 to 1.2. In terms of WEMWBS, this means that 16-24 year olds are just as likely to have a WEMWBS score 2.7 points lower than someone in the 45-54 age range *or* 1.2 WEMWBS points higher.

Statistically significant differences

- There are no statistically significant differences between age groups for either men or women when comparing β coefficients for WEMWBS across age.

Associations with socio-demographic variables

Education and employment show associations with mental wellbeing scores. Another socio-demographic measure is deprivation level, classified by the Index of Multiple Deprivation (IMD, 2010). It is a combined measure of a Lower Super Output Area's total 'score' of multiple factors related to deprivation.

While both deprivation quintile and education and employment can be used to understand social and economic factors, education and employment are measured at the individual level and are more accurate (socio-demographically) from person to person. Therefore, level of deprivation is not included in this multiple regression model.

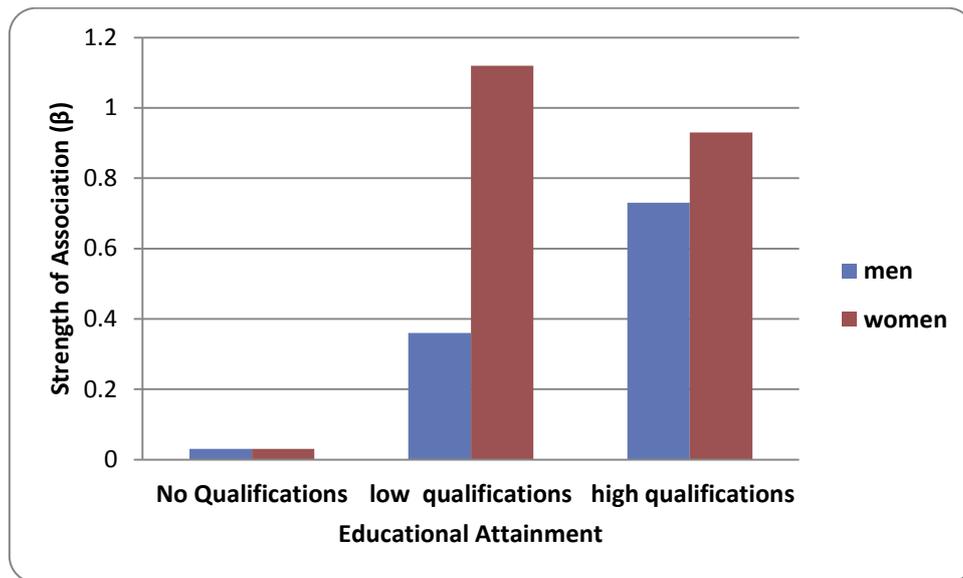
Education

In past years, education has been a significant factor for the total sample, and for men and women, though the strength of this association has fluctuated. This year the trend is the same with those with some qualifications having higher levels of mental wellbeing than those with no qualifications. However, this trend was not statistically significant, meaning that those with some qualifications were just as likely to have higher or lower levels of mental wellbeing than those with no educational qualifications.

Statistically significant associations

- In the total sample and among men, educational qualifications were not statistically significantly associated with WEMWBS scores compared with those who reported no educational qualifications.

Figure 7. Associations between education level and mental wellbeing



Employment

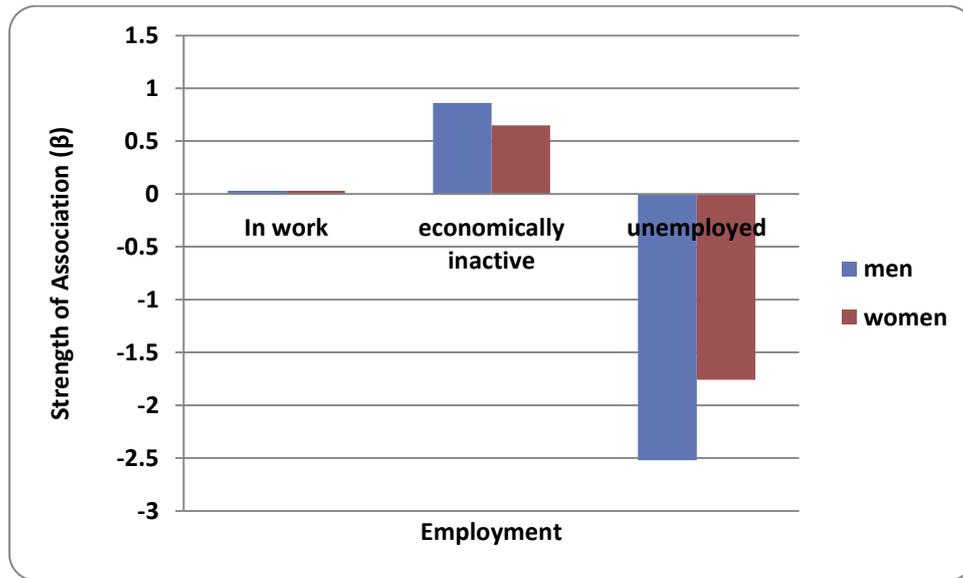
The strength of the relationship between employment and mental wellbeing has fluctuated in past years. This year, the general trend remains the same for both men and women; those in work or who are economically inactive tend to have higher levels of mental wellbeing than those who are unemployed.

- After accounting for other variables only unemployment amongst men was significantly associated with mental wellbeing levels.
- Among women, the association between unemployment and mental wellbeing levels was borderline significant ($B=-1.76$ (-3.55, 0.03)).

Statistically significant associations:

- Unemployed men have significantly lower average levels of mental wellbeing (around 2.5 WEMWBS points lower) compared to employed men.

Figure 8. Associations between employment and mental wellbeing



Disability

- In the total population and for men and women, having a disability is associated with significantly lower levels of mental wellbeing (not shown).
- Among men, those who have a limiting longstanding illness or disability have WEMWBS scores on average 2.25 WEMWBS points lower than those who do not have a disability.
- Among women, those who have a limiting longstanding illness or disability have WEMWBS scores on average 3 WEMWBS points lower than those who do not have a disability.

Statistically significant associations:

- For both men and women, reporting a limiting longstanding illness or disability is associated with significantly lower levels of mental wellbeing.

Health and Lifestyle Characteristics

Sleep quality

Quality of sleep is strongly associated with mental wellbeing levels observed in this sample, as well as in previous Coventry Wellbeing Reports. In general, the better your quality of sleep, the higher your mental wellbeing level. The trends are similar for men and women.

- WEMWBS scores were about 2.5 points lower on average among those with **average** sleep quality compared to those with **good** sleep quality.
- Those with poor sleep quality have WEMWBS scores that were on average 4 WEMWBS points lower than those who reported good sleep quality.

Statistically significant associations:

- In the total population and for men and women, both average and poor levels of sleep quality were significantly associated with lower mental wellbeing levels, compared to good sleep quality.

Figure 9. Associations between sleep quality and mental wellbeing



Fruit & vegetable consumption

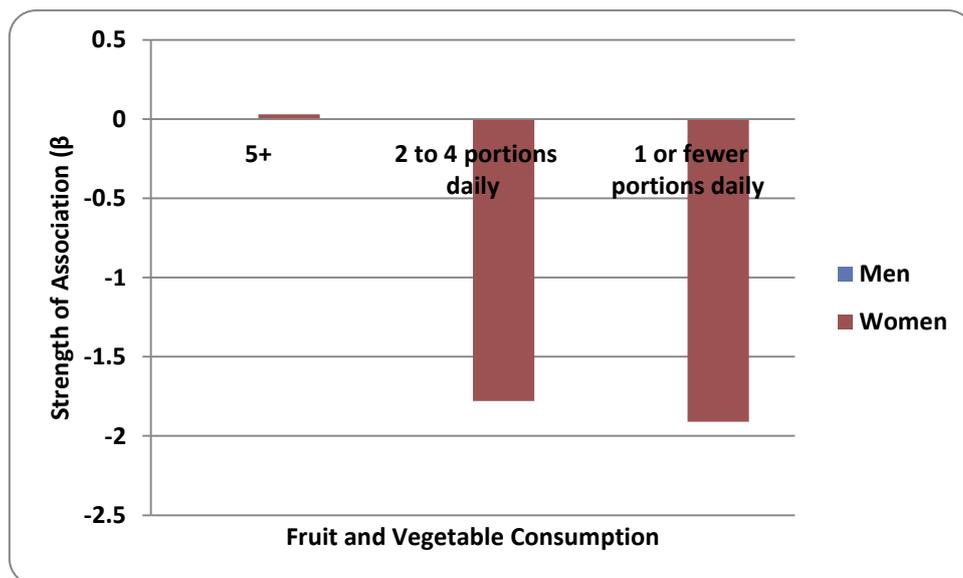
This year's trend follows that of last year. Average mental wellbeing was significantly lower among people who ate under 5 portions of fruits and vegetables daily.

- For men, fruit and vegetable consumption did not enter in to the regression model this year.
- Women eating 2 to 4 portions had WEMWBS scores around 1.8 points lower than those eating optimal (5+) amounts. Women eating less than one portion a day had WEMWBS scores around 2 points lower than those eating 5+ portions a day.

Statistically significant associations:

- For women, eating **fewer** than five portions of fruit and vegetables daily was significantly associated with **lower** levels of mental wellbeing.

Figure 10. Associations between fruit and vegetable consumption and mental wellbeing



Physical activity

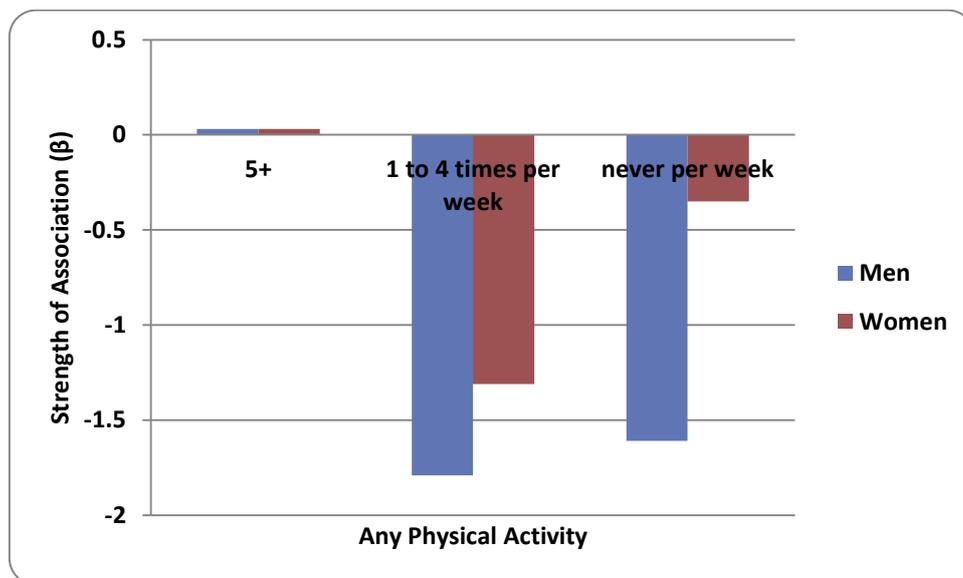
Reporting any physical activity was associated with mental wellbeing levels among men and women.

- Doing any physical activity per week, from playing sports to walking to the shops was associated with mental wellbeing for women and for men.
- Among men and women, those who did any physical activity between 1 and 4 times per week had significantly lower levels of mental wellbeing (on average) than those who were active 5 times per week.
- Among men, those who were active 1 to 4 times per week also had significantly lower average levels of mental wellbeing than those who were active more frequently.

Statistically significant associations:

- For men and women, doing any physical activity 4 times per week or less than that was significantly associated with lower levels of mental wellbeing.

Figure 11: Associations between physical activity and mental wellbeing



Social Support & Connectedness

Starting in 2012, questions about levels of social support and connectedness to others were asked in the questionnaire. This year additional questions were asked:

- ‘How satisfied are you with your personal relationships?’
- ‘Do you feel you have time to do the things you really enjoy?’

Questions asked in the past include frequency socialising with friends and neighbours, and several questions regarding help and support in situations of need. Here we include marital status, though it is usually found in the socio-demographic section.

Marriage and Partnerships

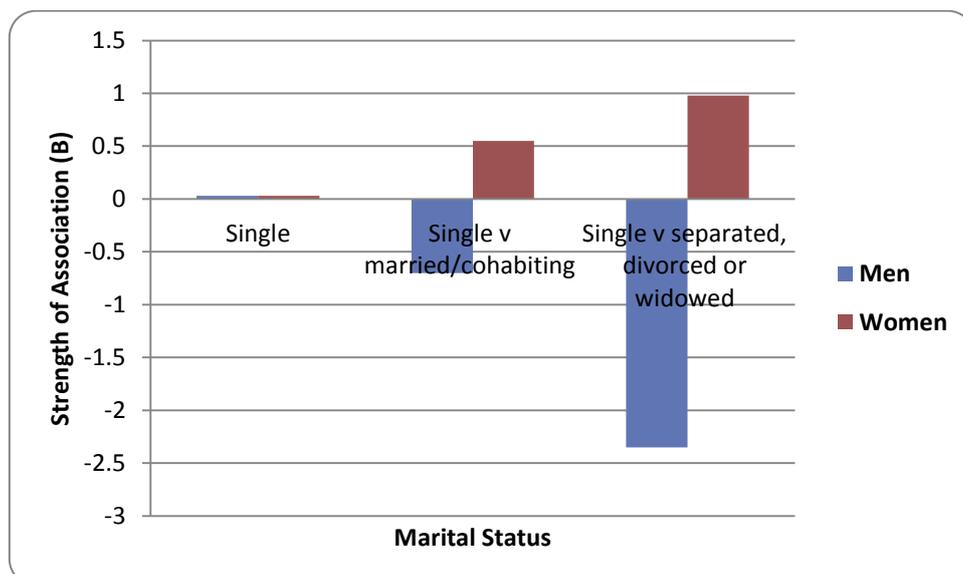
One variable included in previous years but not always seen to be associated with mental wellbeing was ‘marital/relationship status’. This year, this variable was included in the models for both men and women, and there were differences for men and women.

- For women, after accounting for other variables in the model, there were no significant associations between marital status and mental wellbeing.

Statistically significant associations

- For men, being separated/divorced/widowed was significantly associated with a WEMWBS score around 2.4 WEMWBS points lower than single men.

Figure 12. Association between marital status and mental wellbeing



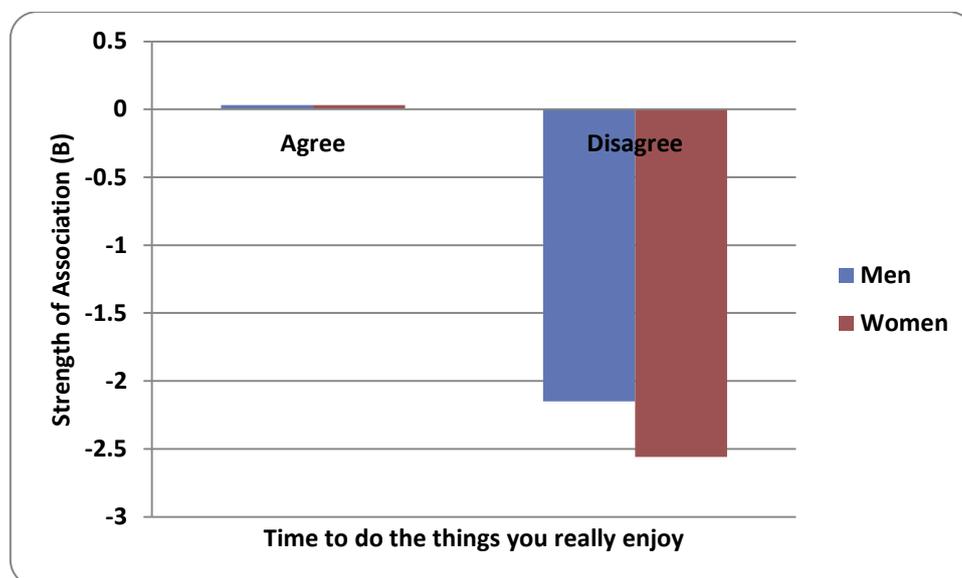
Have time to do things you really enjoy

This was a new question this year. For both men and women, this variable was strongly associated with mental wellbeing. Those who agreed they had time to do the things they really enjoyed had WEMWBS scores on average 2 WEMWBS points higher among men and 2.6 points higher among women.

Statistically significant associations

- These associations were statistically significant for both men and women.

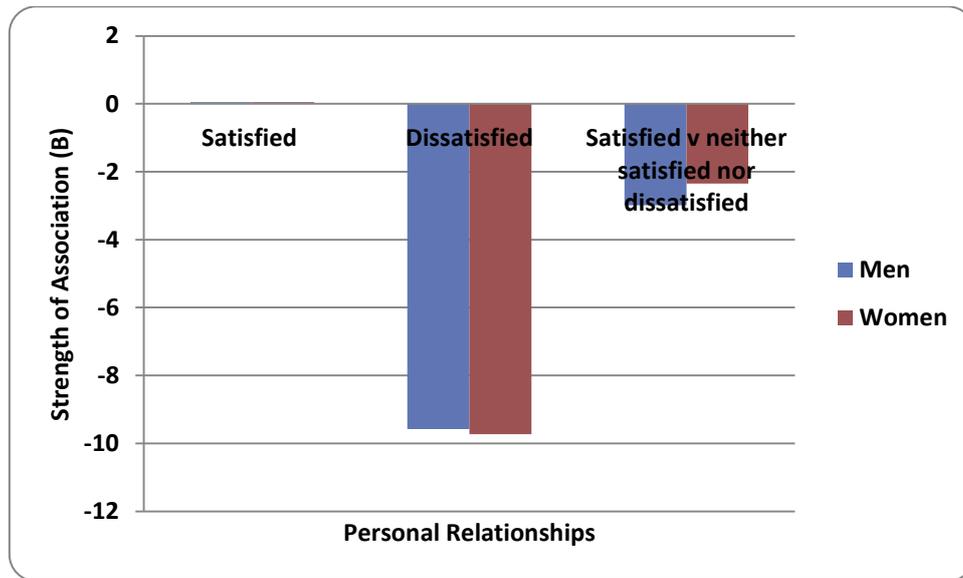
Figure 13. Association between 'time to do things you enjoy' and mental wellbeing



Satisfaction with personal relationships

Satisfaction with personal relationships was strongly associated with higher levels of mental wellbeing (p41). Women and men who reported dissatisfaction with their personal relationships had mental wellbeing levels nearly 10 WEMWBS points **lower** on average than those who were satisfied. This was the strongest association identified in the 2013 analysis.

Figure 15. Association between satisfaction with personal relationships and mental wellbeing



Socialising with friends or family

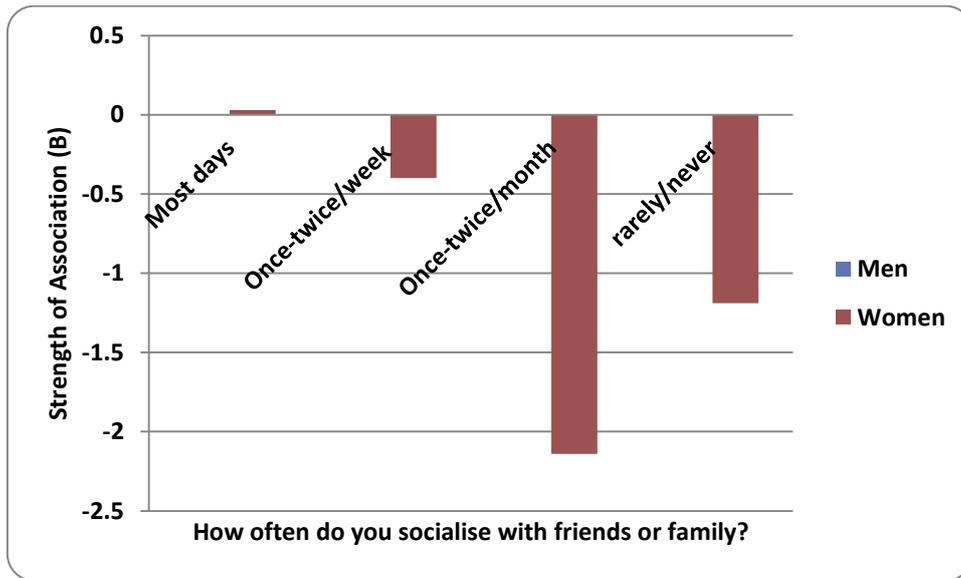
This variable was associated with mental wellbeing levels among women, but not among men. Women who socialised with friends or family once or twice a month (who they did not live with) had WEMWBS scores on average 2 points lower than those who socialised on most days of the week.

The difference in average WEMWBS scores among those socialising once or twice a week, and those who rarely or never socialise with family or friends was not statistically significantly different from those who socialised most days. This means people who responded in those ways were just as likely as those socialising most days to have higher or lower levels of mental wellbeing.

Statistically significant associations:

- Women who infrequently socialised with friends or family (once or twice a month) showed on average significantly **lower** WEMWBS scores than those who socialised much more frequently, on most days of the week.

Figure 16: Association between frequency of socialising and mental wellbeing



Situations of need

In the survey a number of questions were asked relating to situations where the participant might need help and if they would ask for help.

The situations were:

- You need a lift somewhere urgently
- You are ill in bed and need help at home
- You are in financial difficulty and need to borrow £100
- You have a serious personal crisis and need someone to turn to for comfort and support.

Participants were given three response options: yes they would ask for help, no they would not, or that it would depend on the situation.

Of these situations, ‘ill in bed’ and ‘personal crisis’ were entered into the multiple regression model, but were not strongly associated with mental wellbeing to the degree that they were included in the final multiple regression model. Therefore these results are not presented here.

Neighbourhoods & Communities

The following factors relate to how respondents feel about their homes and neighbourhoods including their perception of local crime and safety.

Neighbourhood satisfaction

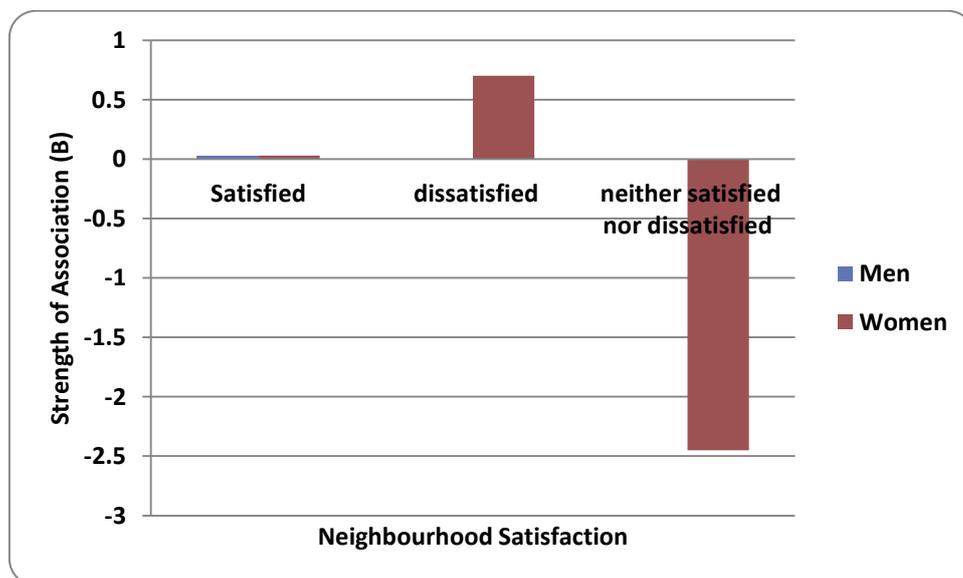
Neighbourhood satisfaction was only a factor associated with mental wellbeing in women (as in 2012), in previous years this variable has been associated with satisfaction in men (2010).

Women who were neither satisfied nor dissatisfied with their neighbourhood had mental wellbeing levels nearly 2.5 points lower on average than women who were satisfied with their neighbourhood. Those who were dissatisfied were *just as likely* to have higher or lower levels of mental wellbeing than those who were satisfied.

Statistically significant associations

- Despite the somewhat misleading bar for 'dissatisfied', only the 'neither' association with mental wellbeing was statistically significant ($p < .05$).

Figure 17. Association between neighbourhood satisfaction and mental wellbeing



Satisfaction with home quality

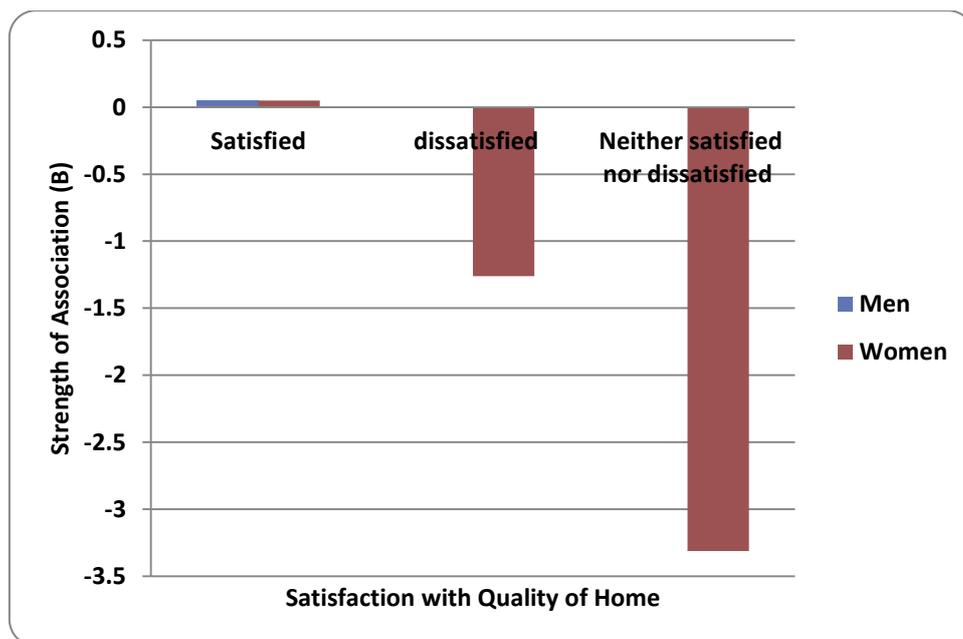
Being satisfied with the quality of one's home was a factor included in the total sample and again for women, but not for men.

- Women who were neither satisfied nor dissatisfied with their home had on average 3.3 points lower than those who were satisfied with the quality of their home.
- This is contrast to last year, where the relationship between lower levels of mental wellbeing among those reporting dissatisfaction with the quality of their home.

Statistically significant associations:

- Amongst women, those who were neither satisfied nor dissatisfied with the quality of their home had significantly lower levels of mental wellbeing on average than those who were satisfied with the quality of their home.

Figure 18. Associations between satisfaction with home and mental wellbeing



Influence decisions in local area

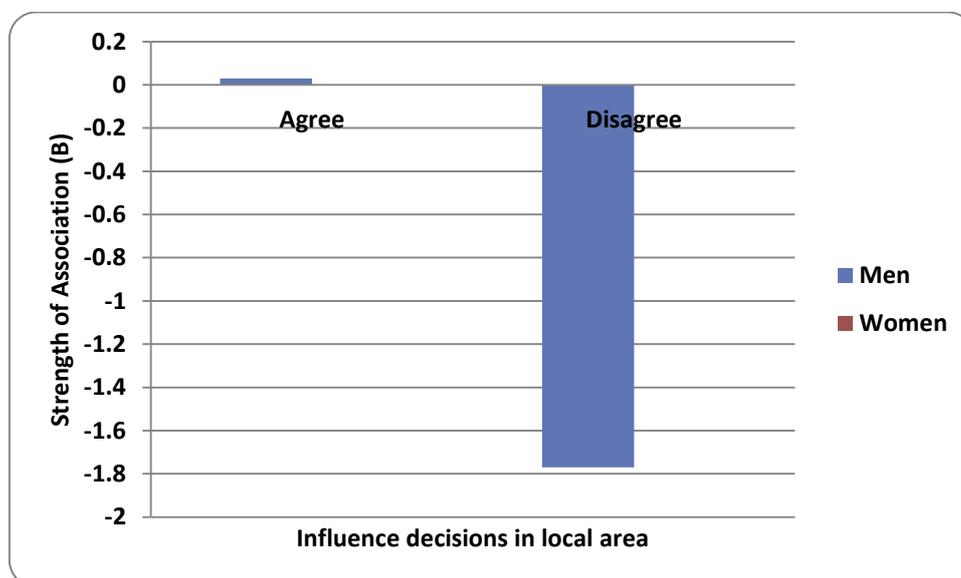
Participants were asked whether they agreed or disagreed they could influence decisions in their local area. This factor was associated with mental wellbeing among men, but not women.

Men who disagreed they could influence decisions in their local area had WEMWBS points 1.8 points lower on average compared with those who agreed they could influence decisions.

Statistically significant associations

- The association between lower mental wellbeing levels among men who disagreed versus those who agreed they could influence decisions in their local area was statistically significant ($p < .001$).

Figure 19. Association between 'influence decisions' and mental wellbeing



Environment: Access to parks and open spaces

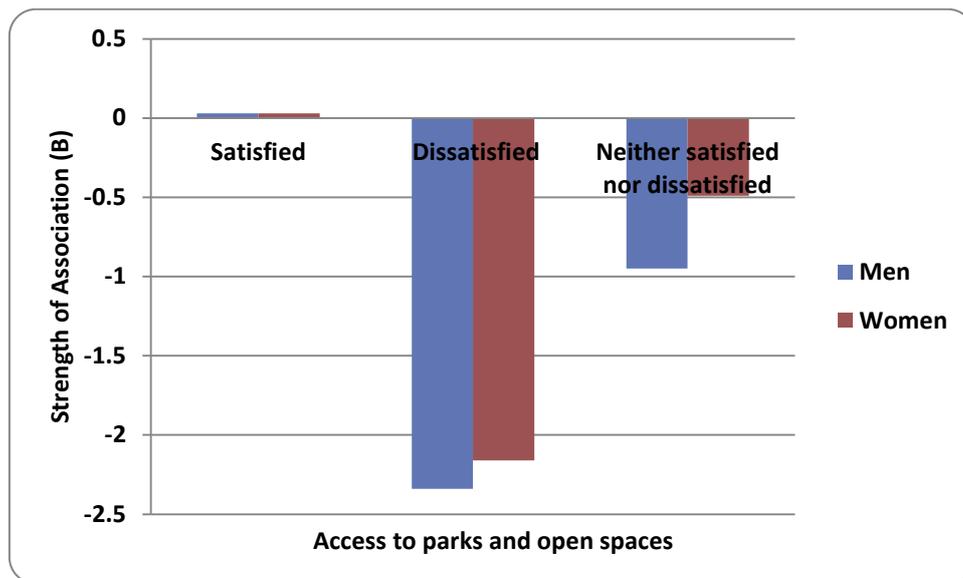
Several different environment questions were asked this year:

- Quality of parks and open spaces
- Access to parks and open spaces
- Cleanliness of streets
- Repair and maintenance of streets

Satisfaction with access to parks and open spaces was associated with mental wellbeing.

Three out of four of these environment based variables were not associated with mental wellbeing after accounting for other variables in the model. For both men and women, dissatisfaction with access to parks and open spaces was associated with lower levels of mental wellbeing. For men, those who were dissatisfied had an average WEMWBS score 2.3 WEMWBS points **lower** than men who were satisfied with parks and open spaces. Among women this was 2.2 points lower compared with women who were satisfied.

Figure 20. Association between access to parks and open spaces and mental wellbeing



Neighbourhood safety at night

In past years the inclusion of this variable in the multiple regression model has varied. This year (the same as in 2012) feeling unsafe at night was a factor included in the regression model for women, but these inclusions were not statistically significant when accounting for the other variables in the model. This means respondents are just as likely to have low or high levels of mental wellbeing whether they feel safe at night-time or not (not shown).

Financial status

New to the survey last year were two questions concerning perceptions of income, known to be associated with mental wellbeing [31-33].

This year these two questions resulted in different responses from men and women.

Worrying about money

Worrying about money was associated with mental wellbeing among men.

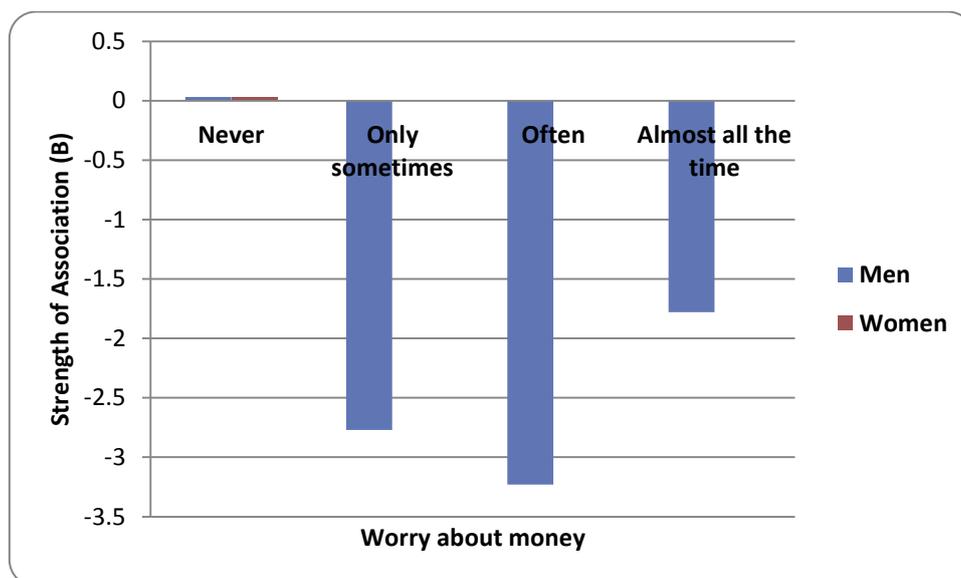
- On average those who worry only sometimes had WEMWBS scores around 2.8 points **lower** than those who reported they never worry about money. Those who often worry have WEMWBS scores around 3.2 WEMWBS points lower than those who never worry, and those who worry almost all the time did not show a statistically significant association with mental wellbeing levels they were just as likely to have higher or lower mental wellbeing levels compared with those never worrying about money.

This factor was not associated with mental wellbeing levels among women in the final regression model.

Statistically significant associations:

- Compared with men who never worry about money, those who worry sometimes or often have significantly lower levels of mental wellbeing on average.

Figure 21. Association between worrying about money and mental wellbeing



Relative income

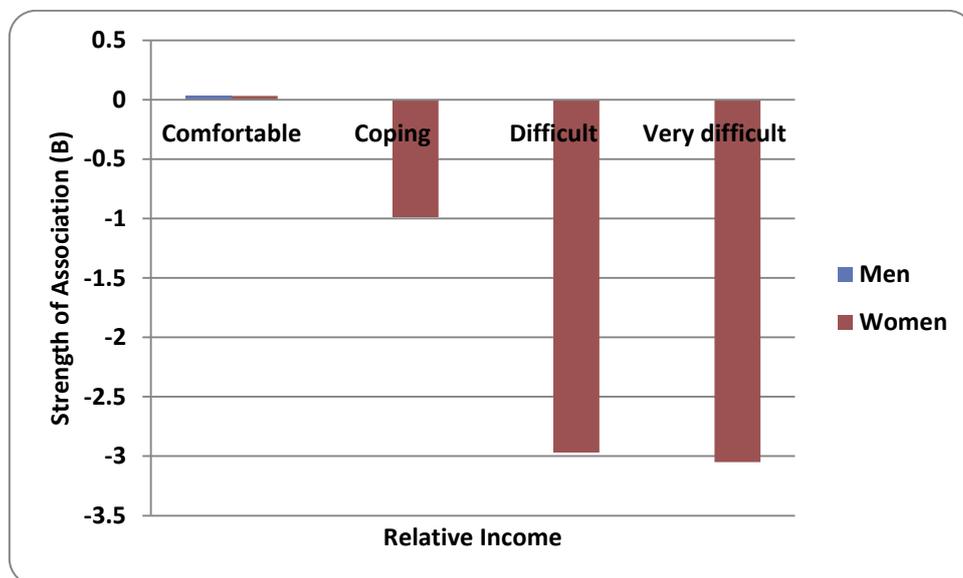
This question asked respondents to report on the degree of comfort or difficulty they had with their household income. It was associated with mental wellbeing in the model for women only.

- When comparing women who reported living comfortably on their present income , those who were ‘coping’ were just as likely to have high or low mental wellbeing levels as those ‘comfortable’ on their present income.
- For women who were finding their present income difficult to get by on, their WEMWBS scores were around 3 points lower than those comfortable.
- On average, women who found things very difficult on their present income also had WEMWBS scores around 3 points lower than those who were comfortable.

Statistically significant associations:

- The variable ‘finding it difficult’ or ‘very difficult’ showed statistically significant associations with lower mental wellbeing levels ($p < .001$).

Figure 22. Associations between feelings about income and mental wellbeing



Variables excluded from the regression model

Some variables that were factors associated with mental wellbeing previously and were associated with mental wellbeing in the age and gender adjusted model were not associated in the final, fully adjusted model. Reasons for this could include the different variables included from year to year which can affect the entire model (e.g. satisfaction with personal relationships was very strongly related with mental wellbeing and may 'push out' other less strongly associated variables from the model). These variables were

- Crime increase in past year
- Smoking
- Alcohol
- Social support questions (situations where you would ask for help)

We also excluded the variables life satisfaction and self-rated health because of 'colinearity'. This means these variables were similarly related to other variables in the same way mental wellbeing is, and this can affect the multiple regression model when all variables are included.

Discussion and Key Point Summary

Coventry's population

Overall the findings suggest that the sample for this survey are representative of Coventry as far as age and gender and ethnicity are concerned. There are differences in how deprivation quintile was sampled this year compared with previous Household Surveys. This means year on year changes are likely to be skewed and any comparisons made should be made bearing this in mind.

Mental wellbeing in Coventry

In this fourth cross-sectional sample of Coventry residents, the average WEMWBS score among this sample (50.7) is statistically significantly lower than average scores from 2010 (51.2) and 2011 (51.9) and 2012 (54) (2012 presumed higher due to a systematic measurement bias).

While changes in variables between years mainly concerned variation in the strength of associations, there were some clear differences: Smoking, alcohol, ethnicity and some neighbourhood and environment questions were factors associated with mental wellbeing for either men or women in at least one survey year out of the four we have analysed over time, but not every survey year and not for both men and women⁵.

What do we learn about mental wellbeing after 4 years of CHS?

It is difficult to make comparisons across years of the Coventry household survey: the format has changed, sampling approaches differ, and questions have been added and removed. While each sample of residents is representative of Coventry on the basis of some factors (age, gender, ethnicity, employment) it is not possible to tell the extent to which the sample reflects the health and lifestyle behaviours we are interested in for the whole population, such as fruit and vegetable consumption, physical activity, and quality of sleep.

Yet the samples do show consistencies across both the simple (age and gender adjusted) and multiple (all associated variables assessed together) regression models. In this way it is worthwhile

⁵ It is likely that the inclusion of additional variables from survey to survey may influence these differences statistically across years. While this may make comparisons across years challenging, it does allow us to identify and examine other variables which have been associated with mental wellbeing in other studies.

to examine similarities and consistencies over a longer period of time (which may or may not be statistically significant), rather than searching for differences as evidence of ‘true and meaningful’ change on a yearly basis.

Some of these consistencies or noteworthy findings across years can be viewed in the context of health concerns for Coventry. The Coventry Health Profile shows indicators of health among Coventry residents across a number of years, from 2008-2011, depending on the indicator [3].

In Coventry, smoking and alcohol consumption are areas of concern, with rates of smoking during pregnancy and alcohol-related hospital admissions higher than the average in England, though England as a whole is not without issues surround alcohol misuse [3, 35].

Smoking and alcohol use over four years of analysis in Coventry:

- Smoking (in general) was associated with mental wellbeing after adjusting for age and gender, yet it was not significantly associated after adjusting for other factors in 3 out of 4 CHS years.
- Smoking has showing a small but consistent decline in the proportion of respondents stating they currently smoke, with the proportion stating they are former smokers is steadily increasing. Unfortunately, we can have little confidence in this finding as a trend this year due to changes in the approach to measuring deprivation. Future surveys that reflect Coventry’s deprivation levels should therefore be monitored and be consistent.
- The proportion of people drinking over the limit at least once during the week remains a concern for health in Coventry. Like smoking, alcohol use over the recommended daily limit was initially associated with lower levels of mental wellbeing. However, consistently across years, the fully adjusted regression models do not show a significant association with mental wellbeing. It could be that people drinking over the limit on multiple days a week and who have very low (or very high) mental wellbeing are underrepresented in the survey—they might not answer the door or refuse to participate in the survey. There may be a degree of measurement error associated with this question, and some who drink the most may tend not to express this when completing a questionnaire. It could also be that other variables are more relevant in their associations with mental wellbeing levels.
- Because we already know that poorer mental health and excessive alcohol consumption are associated, and that moderate use of alcohol is associated with better mental health, we

suggest further investigation into correlations between alcohol, health and mental wellbeing to tease out possible interacting factors and identify whether the lack of relationship we observe in this analysis (where we expect one based on other evidence) is a statistical artefact, or suggestive of real differences in how some lifestyle factors are associated with health and mental wellbeing.

Cardiovascular health

Compared to the England average, there are more early deaths from cancer, heart disease and stroke, a significantly greater proportion of obese adults and obese children and significantly lower rates of physical activity among children (adult's physical activity being on a par with England's average) in Coventry. We know that fruit and vegetable consumption and physical activity are good for heart health. Across all four wellbeing reports, we found that:

- Higher fruit and vegetable consumption and frequent physical activity were strongly associated with higher levels of mental wellbeing, and that this differed between men and women. Multiple regression models for women more consistently show significant associations between mental wellbeing and fruit and vegetable consumption, while models for men showed more consistent significant associations between mental wellbeing and physical activity (data not shown).
- This report supports the continued promotion and importance of increasing fruit and vegetable consumption and physical activity levels for multiple public health outcomes in Coventry.

Neighbourhood factors

- Over four years, associations between some neighbourhood factors fluctuated in the strength of association with mental wellbeing levels. It appears that, more often than not, neighbourhood factors such as home and neighbourhood satisfaction, housing tenure, and influencing decisions in local area were not consistently, significantly associated with mental wellbeing. This is not to say that satisfaction with these factors isn't important to mental wellbeing, but it does suggest other factors may play a larger role.
- Excluding this year's deprivation data (due to differences in sample proportion) all three other surveys showed a non-linear association between levels of deprivation and mental

wellbeing. While there are differences between quintiles, there is little evidence of a trend demonstrating consistent increases between more affluence and greater mental wellbeing. Further investigation into this finding is warranted.

Social connectedness

- Both surveys in 2012 and 2013 show a strong association between some types of social connectedness. This year, the variable ‘satisfying personal relationships’ was introduced and proved to be one of the most strongly associated factors with mental wellbeing (being satisfied was associated with higher levels of mental wellbeing). For women, often socialising with friends or family was associated with higher mental wellbeing levels than infrequently socialising, though those who never socialised with friends or family were just as likely to have higher or lower mental wellbeing levels as those frequently socialising.
- That being said, a social support variable that was not associated was ‘contact with neighbours’. This might be due to the poor wording of the question, as contact with neighbours might not be a pleasant experience, making the assumption that the experience is inherently pleasant.

Money worries & Income

- In both years financial variables were asked, those who felt comfortable on their present income had higher levels of mental wellbeing than those who felt they were coping, found it difficult and very difficult. Similarly, those who rarely worried about money had higher levels of mental wellbeing than those who worried more often. This is not a surprise, but does incorporate a range of health and social issues into thinking about improving mental wellbeing in the population of Coventry.

Sleep quality

- Every year that sleep quality has been measured it is among the most strongly and consistently related variables under scrutiny. As in past years, investigating this relationship in further detail is warranted.

Summary and conclusion

It is becoming increasingly clear that mental wellbeing is associated with many factors in ways we cannot tease out in a cross-sectional survey. We can say, however, that the consistencies of factors such as sleep quality, fruit and vegetable consumption, physical activity, perceptions of income and satisfying relationships establish a benchmark of concepts and behaviours important for health, and that now includes mental wellbeing.

Based on four years of cross-sectional data, we have found that people with higher levels of mental wellbeing are more frequently physically active, whether that activity is taking a walk or cycling for miles; that they eat optimal amounts of fruits and vegetables, they don't have a disability which limits them a little or a lot, they feel comfortable on their present income, feel satisfied in their personal relationships with others, and feel they get good quality sleep.

Strengths & Weaknesses

As in previous years, the major weakness of this analysis and report is that it cannot demonstrate a causal relationship between mental wellbeing and the factors examined. Correlation between a factor and mental wellbeing does not automatically imply that the factor causes alteration in wellbeing scores.

It is also likely that there is a selection bias due to the responsiveness of households who have agreed to participate. Different types of people in different years may decide to take part or some people may have been unable to complete the survey due to health or mental wellbeing factors which we are unaware of – both these may affect our findings. However when we look at associations (e.g. between wellbeing and fruit and vegetable consumption) within the data this effect is diluted and may not be as important.

Another bias to be aware of comes from comparisons between previous years, this year, and the 2012 survey. The survey from 2012 shows considerably higher average WEMWBS scores, and this is likely due to the way the WEMWBS scale was presented in the questionnaire itself (with the scale presented from 'all of the time' (5) to 'none of the time' (1), rather than as the WEMWBS scale items should be presented from 'none of the time' to 'all of the time'). This reflects a systematic measurement bias.

Particular to this year, the sampling approach for deprivation level did not reflect Coventry's own levels of deprivation, and therefore this may have skewed some of the relationships between variables (e.g. smoking). This made it difficult to be confident in some of the cross-year patterns.

Some factors which might be important or associated with mental wellbeing have not been included in this survey (such as poor mental health or mental illness). We support the exclusion of such factors are beyond the scope and aim of the household survey where we aim to examine the general population and factors associated with positive mental health and wellbeing rather than illness.

Sometimes variables which have been associated with mental wellbeing in some years but not others may depend of the relationship with another potential factor.

Because of the large number of variables, there may be interactions which have not been accounted for which may influence the outcomes we see.

A strength of this survey is that it considers multiple factors simultaneously in a fairly large sample, and can reflect more nuanced associations than some other surveys using simpler analytical methods.

Finally, the consistent use of WEMWBS as a measurement tool allows local and national survey results (and recently health intervention outcomes) of mental wellbeing levels to be considered and monitored, carrying on the national conversation about what is important for mental and physical wellbeing. This provides a backdrop from which to approach the challenges Public Health face using local, context driven data which can be compared at a national level providing a mosaic of evidence for what factors are associated with flourishing people and communities.

Key Points & Recommendations

Consistent with last year's key messages:

- The association between mental wellbeing, high fruit and vegetable consumption and frequent moderate physical activity remained strong and are consistently associated with higher levels of mental wellbeing. It remains likely that the *promotion of healthy lifestyles will improve mental as well as physical wellbeing*.
- Good sleep quality has also been a consistently strong factor relating to higher levels of mental wellbeing. Investigating the extent to which poor sleep quality is a manifestation or a cause of poor wellbeing and how Public Health can work to address the improvement of sleep quality continues to be important.
- Lower levels of worry about money and feeling comfortable on present income was again significantly related to higher levels of mental wellbeing. Evidence-based interventions or services which provide support in managing finances may contribute to better mental wellbeing.

New to this year:

- Satisfaction with Personal Relationships and regularly socialising with friends or family were related to higher mental wellbeing levels – promoting opportunities for positive social experiences may have merit from a public health perspective.

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Appendix A: Additional tables- Multiple linear regression results

Multiple linear regression determinants of WEMWBS scores for the total population, and stratified population by gender.			
	Association with WEMWBS score (regression coefficient with 95% CI)		
Variable	Total (n=2111)	Men (n=1020)	Women (n=1095)
Adjusted Variables			
Gender	-1.11 (-1.84, -0.39)**	--	--
Age band			
16-24	2.19 (0.77, 3.61)**	2.95 (0.92, 4.98)**	1.59 (-0.28, 3.45)
25-34	1.90 (0.64, 3.16)**	2.05 (0.27, 3.84)*	2.35 (0.61, 4.10)**
35-44	1.17 (-0.06, 2.4)	2.13 (0.40, 3.85)*	0.45 (-1.28, 2.18)
45-54(REFERENCE)	Reference group	Reference group	Reference group
55-64	0.91 (-0.41, 2.22)	0.52 (-1.28, 2.33)	1.55 (-0.35, 3.47)
65-74	-0.01 (-1.56, 1.53)	0.04 (-2.11, 2.19)	0.41 (-1.80, 2.62)
75+	-0.67 (-2.61, 1.28)	-0.16 (-2.86, 2.54)	-0.27 (-2.93, 2.39)
Disability			
None v limited a little	-2.34 (-3.45, -1.22)**	-1.53 (-3.04, -0.02)*	-3.35 (-4.96, -1.74)**
None v limited a lot	-4.59 (-5.99, -3.18)**	-3.87 (-5.89, -1.85)**	-4.63 (-6.6, -2.66)**
Education			
No qualifications v low qualifications	0.94 (0.00, 1.89)*	1.48 (0.20, 2.76)*	0.62 (-0.75, 1.99)
No qualifications v high qualifications	0.66 (-0.38, 1.69)	0.74 (-0.62, 2.1)	0.87 (-0.66, 2.40)
Employment			
In work v economically inactive	-0.17 (-1.08, 0.73)	-0.86 (-2.29, 0.57)	0.25 (-0.95, 1.45)
In work v unemployed	0.75 (-2.06, 0.56)	-1.05 (-2.72, 0.61)	-2.45 (-4.51, -0.40)*
Health & Lifestyle			
Sleep quality			
Poor v average	4.03 (2.94, 5.13)	4.07 (2.45, 5.68)**	3.14 (1.53, 4.75)**
Poor v good	6.04 (4.94, 7.14)	6.19 (4.60, 7.77)**	4.60 (2.79, 6.40)**
Sleep Hours			
7-8 v 6 or fewer hours	--	--	-1.46 (-2.72, -0.21)*
7-8 v 9+ hours	--	--	1.01 (-1.16, 3.19)
Fruit and vegetable consumption			
5+ v 2 to 4 portions daily	-1.12 (-1.92, -0.32)*	-1.45 (-2.62, -0.29)*	-1.34 (-2.43, -0.25)*
5+ v 1 or fewer portions daily	-2.09 (-3.5, -0.65)*	-3.13 (-5.04, -1.24)**	-1.87 (-4.04, 0.31)
Physical Activity, Any			
5+ v 1 to 4 times per week	-1.31 (-2.06, -0.56)**	-1.45 (-2.51, -0.39)**	-1.06 (-2.12, -0.01)*
5+ v never per week	-1.86 (-3.11, -0.63)**	-1.47 (-3.11, 0.17)	-2.48 (-4.36, -0.60)**
Smoking			
Never smoked v currently	-0.95 (-1.83, -0.07)*	--	-1.11 (-2.34, 0.12)
Never smoked v no longer	-1.29 (-2.36, -0.24)*	--	-0.98 (-2.64, 0.68)
Social Support- Needing help			
Being ill in bed			
Would ask for help v no	-1.50 (-2.47, -0.53)**	-1.33 (-3.24, 0.58)	--
Would ask for help v it depends	-0.29 (-2.19, 1.61)	0.51 (-2.69, 3.73)	--
Serious personal crisis			
Would ask for help vs no	--	-0.65 (-2.51, 1.21)	--
Would ask for help v it depends	--	-3.40 (-5.8, -0.96)**	--

Relationship status			
Married/cohabiting v single	0.98 (0.06, 1.90)*	1.22 (-0.07, 2.50)	--
Separated, divorced or widowed v single	0.29 (-1.00, 1.59)	-1.11 (-3.11, 0.88)	--
Neighbourhoods & Communities			
Home satisfaction			
Satisfied v dissatisfied	-1.67 (-3.32, -0.03)*	--	-3.38 (-5.75, -1.00)**
Satisfied v neither satisfied nor dissatisfied	-0.21 (-2.17, 1.74)	--	-0.30 (-3.06, 2.46)
Night-time neighbourhood safety			
Feeling safe v unsafe	-0.80 (-1.75, 0.15)	--	-0.75 (-1.97, 0.48)
Crime increase in the past year			
Disagree v agree	-0.57 (-1.52, 0.39)	-1.51 (-2.77, -0.24)*	--
Disagree v neither or no opinion	0.33 (-0.48, 1.14)	-0.18 (-1.29, 0.94)	--
Neighbourhood satisfaction			
Satisfied v dissatisfied	-1.89 (-3.40, -0.38)*	--	-2.48 (-4.62, -0.35)*
Satisfied v neither satisfied nor dissatisfied	0.33 (-1.36, 2.02)	--	0.47 (-2.01, 2.95)
Financial status			
Money worries			
Never v Almost all the time	-3.74 (-5.48, -1.99)**	-4.47 (-6.48, -2.46)**	-6.49 (-8.56, -4.41)**
Never v Often	-2.09 (-3.39, -0.80)**	-1.50 (-2.96, -0.03)*	-4.20 (-5.71, -2.69)**
Never v Only sometimes	-1.37 (-2.37, -0.37)**	-1.10 (-2.22, 0.03)	-2.43 (-3.61, -1.24)**
Relative Income			
Comfortable v coping	-0.40 (-1.36, 0.55)	--	--
Comfortable v difficult	-1.88 (-3.26, -0.52)**	--	--
Comfortable v very difficult	-2.95 (-5.47, -0.43)*	--	--